STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

STANDARD LOW BID PROJECT – INVITATIONAL
Project Budgets $50,000 - $100,000

January 11, 2007

CAMP FLOYD/STAGECOACH INN STATE PARK CEMETERY SPRINKLER IRRIGATION SYSTEM IMPROVEMENTS

DIVISION OF PARKS & RECREATION

FAIRFIELD, UTAH

DFCM Project Number 06136510

Bill Flanders P.E.
131 North 800 West
West Bountiful, Utah 84087

TABLE OF CONTENTS

Current copies of the following documents are hereby made part of these contract documents by reference. These documents are available on the DFCM web site at http://dfcm.utah.gov or are available upon request from DFCM.

DFCM General Conditions dated May 25, 2005.
DFCM Application and Certification for Payment dated May 25, 2005.

Technical Specifications :
Drawings:

The Agreement and General Conditions dated May 25, 2005 have been updated from versions that were formally adopted and in use prior to this date. The changes made to the General Conditions are identified in a document entitled Revisions to General Conditions that is available on DFCM's web site at http://dfcm.utah.gov

INVITATION TO BID

Only firms that have been invited to submit bids on this project are allowed to bid on this project.

Sealed bids will be received by the Division of Facilities Construction and Management (DFCM) for:

CAMP FLOYD/STAGECOACH INN STATE PARK CEMETERY SPRINKLER IRRIGATION SYSTEM IMPROVEMENTS
DIVISION OF PARKS & RECREATION, FAIRFIELD, UTAH
DFCM PROJECT NO: 06136510

Company	Contact	Telephone	Fax
Kevin D. Allen & Associates	Kevin D. Allen	801-943-9588	801-943-9588
WKB Landscape	Bill Berd	801-598-6148	801-260-0669
ACE Landscape	Jayson Christensen	801-484-5333	801-766-0303
J. Lynne Roberts & Sons	Scott Roberts	801-404-1752	801-374-2073

Bids will be in accordance with the Contract Documents that will be available on January 11, 2007, and will only be distributed on the DFCM web page at http://dfcm.utah.gov. For questions regarding this project, please contact Brent Lloyd, DFCM, at 801-538-3471. No others are to be contacted regarding this bidding process. The construction budget for this project is $70,500.00.

No formal pre-bid meeting will be held on this project, those invited to bid should be familiar with the project due to a bid process which took place on December 5, 2006.

Bids will be received until the hour of 2:00 PM on January 24, 2007 at the Wasatch Building at the Utah State Fairpark, approximately 155 North 1000 West, Salt Lake City, Utah. Refer to the map on the DFCM website for directions (http://dfcm.utah.gov/downloads/fairpark_map.pdf). Bids will be opened and read aloud in the Wasatch Building at the Utah State Fairpark. NOTE: Bids must be received at the Wasatch Building at the Utah State Fairpark by the specified time.

A bid bond in the amount of five percent (5%) of the bid amount, made payable to the Division of Facilities Construction and Management on DFCM's bid bond form, shall accompany the bid.

The Division of Facilities Construction and Management reserves the right to reject any or all bids or to waive any formality or technicality in any bid in the interest of DFCM.

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT
Joanna Fisher, Contract Coordinator
4110 State Office Building, Salt Lake City, Utah 84114

PROJECT DESCRIPTION

This project is a complete upgrade of the existing landscape irrigation system at the Camp Floyd/Stagecoach Inn State Pard Cemetery, located at 18035 West 1540 North, Fairfield, Utah. The system is served by a shallow well; the project includes, but is not limited to, refurbishment/replacement of the existing pumps, seals, vents, tanks, vaults, piping, and electrical as described in the plans and specifications for a completely new pressurized irrigation system with electronic controls.

PROJECT SCHEDULE

PROJECT NAME: CAMP FLOYD/STAGECOACH INN STATE PARK CEMETERY SPRINKLER IRRIGATION SYSTEM IMPROVEMENTS – DIVISION OF PARKS & REC. – FAIRFIELD, UTAH.

DFCM PROJECT NO. 06136510

Event	Day	Date	Time	Place
Bidding Documents Available	Thursday	January 11, 2007	10:00 AM	DFCM 4110 State Office Bldg SLC, UT or DFCM web site *
Last Day to Submit Questions	Tuesday	January 16, 2007	4:00 PM	In writing to: brentlloyd@utah.gov fax 801-538-3267
Addendum Issued Responding to Questions (if needed)	Wednesday	January 17, 2007	4:00 PM	DFCM web site *
Prime Contractors Turn In Bid and Bid Bond	Wednesday	January 24, 2007	2:00 PM	Wasatch Building Utah State Fairpark Approx 155 North 1000 West Salt Lake City, UT **
Sub-contractor List Due	Thursday	January 25, 2007	2:00 PM	DFCM 4110 State Office Bldg SLC, UT Fax 801-538-3677
Substantial Completion Date	Friday	May 11, 2007		

* **NOTE: DFCM's web site address is http://dfcm.utah.gov**

** **Due to the ongoing construction on Capitol Hill and the anticipated shortage of parking during 2007, all bids will be received and opened at the Wasatch Building at the Utah State Fairpark. Refer to map on the DFCM web site for directions (http://dfcm.utah.gov/downloads/fairpark_map.pdf)**

BID FORM

NAME OF BIDDER _____ DATE _____

To the Division of Facilities Construction and Management
4110 State Office Building
Salt Lake City, Utah 84114

The undersigned, responsive to the "Notice to Contractors" and in accordance with the "Instructions to Bidders", in compliance with your invitation for bids for the Camp Floyd/Stagecoach Inn Cemetery Irrigation System Upgrades Project No. 06136510 and having examined the Contract Documents and the site of the proposed Work and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of labor, hereby proposes to furnish all labor, materials and supplies as required for the Work in accordance with the Contract Documents as specified and within the time set forth and at the price stated below. This price is to cover all expenses incurred in performing the Work required under the Contract Documents of which this bid is a part:

I/We acknowledge receipt of the following Addenda: _____

For all work shown on the Drawings and described in the Specifications and Contract Documents, I/we agree to perform for the sum of:

Base Bid:

_____ DOLLARS ($_____)
(In case of discrepancy, written amount shall govern)

Additive Alternate No. 1 – Stump Removal Unit Cost Per Stump $_____

Additive Alternate No. 2 – Flag Pole Lighting (One) $_____

I/We guarantee that the Work will be Substantially Complete by Friday, May 11, 2007, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **$200.00** per day for each day after expiration of the Contract Time as stated in Article 3 of the Contractor's Agreement.

This bid shall be good for 45 days after bid opening.

Enclosed is a 5% bid bond, as required, in the sum of _____

The undersigned Contractor's License Number for Utah is _____.

Upon receipt of notice of award of this bid, the undersigned agrees to execute the contract within ten (10) days, unless a shorter time is specified in the Contract Documents, and deliver acceptable Performance and Payment bonds in the prescribed form in the amount of 100% of the Contract Sum for faithful performance of the contract.

The Bid Bond attached, in the amount not less than five percent (5%) of the above bid sum, shall become the property of the Division of Facilities Construction and Management as liquidated damages for delay and additional expense caused thereby in the event that the contract is not executed and/or acceptable l00% Performance and Payment bonds are not delivered within the time set forth.

Type of Organization:

_____
(Corporation, Partnership, Individual, etc.)

Any request and information related to Utah Preference Laws:

_____

Respectfully submitted,

_____
Name of Bidder

ADDRESS:

_____

_____

_____
Authorized Signature

INSTRUCTIONS TO BIDDERS

1. Drawings and Specifications, Other Contract Documents

Drawings and Specifications, as well as other available Contract Documents, may be obtained as stated in the Invitation to Bid.

2. Bids

Before submitting a bid, each contractor shall carefully examine the Contract Documents, shall visit the site of the Work; shall fully inform themselves as to all existing conditions and limitations; and shall include in the bid the cost of all items required by the Contract Documents. If the bidder observes that portions of the Contract Documents are at variance with applicable laws, building codes, rules, regulations or contain obvious erroneous or uncoordinated information, the bidder shall promptly notify the DFCM Representative and the necessary changes shall be accomplished by Addendum.

The bid, bearing original signatures, must be typed or handwritten in ink on the Bid Form provided in the procurement documents and submitted in a sealed envelope at the location specified by the Invitation to Bid prior to the deadline for submission of bids.

Bid bond security, in the amount of five percent (5%) of the bid, made payable to the Division of Facilities Construction and Management, shall accompany bid. THE BID BOND MUST BE ON THE BID BOND FORM PROVIDED IN THE PROCUREMENT DOCUMENTS IN ORDER TO BE CONSIDERED AN ACCEPTABLE BID.

If the bid bond security is submitted on a bid bond form other than DFCM's required bid bond form, and the bid security meets all other legal requirements, the bidder will be allowed to provide an acceptable bid bond by the close of business on the next business day following notification by DFCM of submission of a defective bid bond security. **NOTE: A cashier's check cannot be used as a substitute for a bid bond.**

3. Contract and Bond

The Contractor's Agreement will be in the form found in the specifications. The Contract Time will be as indicated in the bid. The successful bidder, simultaneously with the execution of the Contract Agreement, will be required to furnish a performance bond and a payment bond, both bearing original signatures, upon the forms provided in the procurement documents. The performance and payment bonds shall be for an amount equal to one hundred percent (100%) of the contract sum and secured from a company that meets the requirements specified in the requisite forms. Any bonding requirements for subcontractors will be specified in the Supplementary General Conditions.

4. Listing of Subcontractors

Listing of Subcontractors shall be as summarized in the "Instructions and Subcontractor's List Form", which are included as part of these Contract Documents. The Subcontractors List shall be delivered to DFCM or faxed to DFCM at (801)538-3677 within 24 hours of the bid opening. Requirements for listing additional subcontractors will be listed in the Contract Documents.

DFCM retains the right to audit or take other steps necessary to confirm compliance with requirements for the listing and changing of subcontractors. Any contractor who is found to not be in compliance with these requirements is subject to a debarment hearing and may be debarred from consideration for award of contracts for a period of up to three years.

5. Interpretation of Drawings and Specifications

If any person or entity contemplating submitting a bid is in doubt as to the meaning of any part of the drawings, specifications or other Contract Documents, such person shall submit to the DFCM Project Manager a request for an interpretation thereof. The person or entity submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by addenda posted on DFCM's web site at http://dfcm.utah.gov. Neither the DFCM nor A/E will be responsible for any other explanations or interpretations of the proposed documents. A/E shall be deemed to refer to the architect or engineer hired by DFCM as the A/E or Consultant for the Project.

6. Addenda

Addenda will be posted on DFCM's web site at http://dfcm.utah.gov. Contractors are responsible for obtaining information contained in each addendum from the web site. Addenda issued prior to the submittal deadline shall become part of the bidding process and must be acknowledged on the bid form. Failure to acknowledge addenda may result in disqualification from bidding.

7. Award of Contract

The Contract will be awarded as soon as possible to the lowest, responsive and responsible bidder, based on the lowest combination of base bid and acceptable prioritized alternates, provided the bid is reasonable, is in the interests of the State of Utah to accept and after applying the Utah Preference Laws in U.C.A. Title 63, Chapter 56. DFCM reserves the right to waive any technicalities or formalities in any bid or in the bidding. Alternates will be accepted on a prioritized basis with Alternate 1 being highest priority, Alternate 2 having second priority, etc.

8. DFCM Contractor Performance Rating

As a contractor completes each DFCM project, DFCM, the architect/engineer and the using agency will evaluate project performance based on the enclosed "DFCM Contractor Performance Rating" form. The ratings issued on this project will not affect this project but may affect the award on future projects.

9. Licensure

The Contractor shall comply with and require all of its subcontractors to comply with the license laws as required by the State of Utah.

10. Right to Reject Bids

DFCM reserves the right to reject any or all Bids.

11. Time is of the Essence

Time is of the essence in regard to all the requirements of the Contract Documents.

12. Withdrawal of Bids

Bids may be withdrawn on written request received from bidder prior to the time fixed for opening. Negligence on the part of the bidder in preparing the bid confers no right for the withdrawal of the bid after it has been opened.

13. Product Approvals

Where reference is made to one or more proprietary products in the Contract Documents, but restrictive descriptive materials of one or more manufacturer(s) is referred to in the Contract Documents, the products of other manufacturers will be accepted, provided they equal or exceed the standards set forth in the drawings and specifications and are compatible with the intent and purpose of the design, subject to the written approval of the A/E. Such written approval must occur prior to the deadline established for the last scheduled addenda to be issued. The A/E's written approval will be in an issued addendum. If the descriptive material is not restrictive, the products of other manufacturers specified will be accepted without prior approval provided they are compatible with the intent and purpose of the design as determined by the A/E.

14. Financial Responsibility of Contractors, Subcontractors and Sub-subcontractors

Contractors shall respond promptly to any inquiry in writing by DFCM to any concern of financial responsibility of the contractor, subcontractor or sub-subcontractor.

15. Debarment

By submitting a bid, the Contractor certifies that neither it nor its principals, including project and site managers, have been, or are under consideration for, debarment or suspension, or any action that would exclude such from participation in a construction contract by any governmental department or agency. If the Contractor cannot certify this statement, attach to the bid a detailed written explanation which must be reviewed and approved by DFCM as part of the requirements for award of the Project.

BID BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed, (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the STATE OF UTAH, hereinafter referred to as the "Obligee," in the amount of $_____ (5% of the accompanying bid), being the sum of this Bond to which payment the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted to Obligee the accompanying bid incorporated by reference herein, dated as shown, to enter into a contract in writing for the _____ _____ Project.

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that if the said principal does not execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the principal, then the sum of the amount stated above will be forfeited to the State of Utah as liquidated damages and not as a penalty; if the said principal shall execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the Principal, then this obligation shall be null and void. It is expressly understood and agreed that the liability of the Surety for any and all defaults of the Principal hereunder shall be the full penal sum of this Bond. The Surety, for value received, hereby stipulates and agrees that obligations of the Surety under this Bond shall be for a term of sixty (60) days from actual date of the bid opening.

PROVIDED, HOWEVER, that this Bond is executed pursuant to provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals on the date indicated below, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

DATED this _____ day of _____, 20_____ .

Principal's name and address (if other than a corporation):

_____

_____

By: _____

Title: _____

Principal's name and address (if a corporation):

_____

_____

By: _____

Title: _____

(Affix Corporate Seal)

Surety's name and address:

_____

_____

By: _____

Attorney-in-Fact (Affix Corporate Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this ____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.
My Commission Expires: _____
Resides at: _____

_____
NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

INSTRUCTIONS AND SUBCONTRACTORS LIST FORM

The three low bidders, as well as all other bidders that desire to be considered, are required by law to submit to DFCM within 24 hours of bid opening a list of **ALL** first-tier subcontractors, including the subcontractor's name, bid amount and other information required by Building Board Rule and as stated in these Contract Documents, on the following basis:

PROJECTS UNDER $500,000 - ALL SUBS $20,000 OR OVER MUST BE LISTED
PROJECTS $500,000 OR MORE - ALL SUBS $35,000 OR OVER MUST BE LISTED

- Any additional subcontractors identified in the bid documents shall also be listed.
- The DFCM Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law.
- List subcontractors for base bid as well as the impact on the list that the selection of any alternate may have.
- Bidder may not list more than one subcontractor to perform the same work.
- Bidder must list "Self" if performing work itself.

LICENSURE:

The subcontractor's name, the type of work, the subcontractor's bid amount, and the subcontractor's license number as issued by DOPL, if such license is required under Utah Law, shall be listed. Bidder shall certify that all subcontractors, required to be licensed, are licensed as required by State law. A subcontractor includes a trade contractor or specialty contractor and does not include suppliers who provide only materials, equipment, or supplies to a contractor or subcontractor.

BIDDER LISTING 'SELF' AS PERFORMING THE WORK:

Any bidder that is properly licensed for the particular work and intends to perform that work itself in lieu of a subcontractor that would otherwise be required to be on the subcontractor list, must insert the term 'Self' for that category on the subcontractor list form. Any listing of 'Self' on the sublist form shall also include the amount allocated for that work.

'SPECIAL EXCEPTION':

A bidder may list 'Special Exception' in place of a subcontractor when the bidder intends to obtain a subcontractor to perform the work at a later date because the bidder was unable to obtain a qualified or reasonable bid under the provisions of U.C.A.Section 63A-5-208(4). The bidder shall insert the term 'Special Exception' for that category of work, and shall provide documentation with the subcontractor list describing the bidder's efforts to obtain a bid of a qualified subcontractor at a reasonable cost and why the bidder was unable to obtain a qualified subcontractor bid. The Director must find that the bidder complied in good faith with State law requirements for any 'Special Exception' designation, in order for the bid to be considered. If awarded the contract, the Director shall supervise the bidder's efforts to obtain a qualified subcontractor bid. The amount of the awarded contract may not be adjusted to reflect the actual amount of the subcontractor's bid. Any listing of 'Special Exception' on the sublist form shall also include amount allocated for that work.

GROUNDS FOR DISQUALIFICATION:

The Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law. Director may withhold awarding the contract to a particular bidder if one or more of the proposed subcontractors are considered by the Director to be unqualified to do the Work or for such other reason in the best interest of the State of Utah. Notwithstanding any other provision in these instructions, if there is a good faith error on the sublist form, at the sole discretion of the Director, the Director may provide notice to the contractor and the contractor shall have 24 hours to submit the correction to the Director. If such correction is submitted timely, then the sublist requirements shall be considered met.

CHANGES OF SUBCONTRACTORS SPECIFICALLY IDENTIFIED ON SUBLIST FORM:

Subsequent to twenty-four hours after the bid opening, the contractor may change its listed subcontractors only after receiving written permission from the Director based on complying with all of the following criteria.

(1) The contractor has established in writing that the change is in the best interest of the State and that the contractor establishes an appropriate reason for the change, which may include, but not is not limited to, the following reasons: the original subcontractor has failed to perform, or is not qualified or capable of performing, and/or the subcontractor has requested in writing to be released.
(2) The circumstances related to the request for the change do not indicate any bad faith in the original listing of the subcontractors.
(3) Any requirement set forth by the Director to ensure that the process used to select a new subcontractor does not give rise to bid shopping.
(4) Any increase in the cost of the subject subcontractor work is borne by the contractor.
(5) Any decrease in the cost of the subject subcontractor work shall result in a deductive change order being issued for the contract for such decreased amount.
(6) The Director will give substantial weight to whether the subcontractor has consented in writing to being removed unless the Contractor establishes that the subcontractor is not qualified for the work.

EXAMPLE:

Example of a list where there are only four subcontractors:

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #
ELECTRICAL	ABCD Electric Inc.	$350,000.00	123456789000
LANDSCAPING	"Self"	300,000.00	123456789000
CONCRETE (ALTERNATE #1)	XYZ Concrete Inc	298,000.00	987654321000
MECHANICAL	"Special Exception" (attach documentation)	Fixed at: 350,000.00	(TO BE PROVIDED AFTER OBTAINING SUBCONTRACTOR)

PURSUANT TO STATE LAW - SUBCONTRACTOR BID AMOUNTS CONTAINED IN THIS SUBCONTRACTOR LIST SHALL NOT BE DISCLOSED UNTIL THE CONTRACT HAS BEEN AWARDED.

SUBCONTRACTORS LIST

FAX TO 801-538-3677

PROJECT TITLE: _____

Caution: You must read and comply fully with instructions.

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #

We certify that:

1. This list includes all subcontractors as required by the instructions, including those related to the base bid as well as any alternates.
2. We have listed "Self" or "Special Exception" in accordance with the instructions.
3. All subcontractors are appropriately licensed as required by State law.

FIRM: _____

DATE: _____ SIGNED BY: _____

NOTICE: FAILURE TO SUBMIT THIS FORM, PROPERLY COMPLETED AND SIGNED, AS REQUIRED IN THESE CONTRACT DOCUMENTS, SHALL BE GROUNDS FOR DFCMS REFUSAL TO ENTER INTO A WRITTEN CONTRACT WITH BIDDER. ACTION MAY BE TAKEN AGAINST BIDDERS BID BOND AS DEEMED APPROPRIATE BY DFCM. ATTACH A SECOND PAGE IF NECESSARY.

FUGITIVE DUST PLAN

The Contractor will fill out the form and file the original with the Division of Air Quality and a copy of the form with the Division of Facilities Construction & Management, prior to the issuance of any notice to proceed.

The Contractor will be fully responsible for compliance with the Fugitive Dust Control Plan, including the adequacy of the plan, any damages, fines, liability, and penalty or other action that results from noncompliance.

Utah Division of Air Quality
April 20, 1999

GUIDANCE THAT MUST BE CONSIDERED IN DEVELOPING AND SUBMITTING A DUST CONTROL PLAN FOR COMPLIANCE WITH R307-309-3, 4, 5, 6, 7

Source Information:

1. Name of your operation (source): provide a name if the source is a construction site.

2. Address or location of your operation or construction site.

3. UTM coordinates or Longitude/Latitude of stationary emission points at your operation.

4. Lengths of the project, if temporary (time period).

5. Description of process (include all sources of dust and fugitive dust). Please, if necessary, use additional sheets of paper for this description. Be sure to mark it as an attachment.

6. Type of material processed or disturbed.

7. Amount of material processed (tons per year, tons per month, lbs./hr., and applicable units).

8. Destination of product (where will the material produced be used or transported, be specific, provide address or specific location), information needed for temporary relocation applicants.

9. Identify the individual who is responsible for the implementation and maintenance of fugitive dust control measures. List name(s), position(s) and telephone number(s).

10. List, and attach copies of any contract lease, liability agreement with other companies that may, or will, be responsible for dust control on site or on the project.

Description of Fugitive Dust Emission Activities
(Things to consider in addressing fugitive dust control strategies.)

1. Type of activities (drilling and blasting, road construction, development construction, earth moving and excavation, handling and hauling materials, cleaning and leveling, etc).

2. List type of equipment generating the fugitive dust.

3. Diagram the location of each activity or piece of equipment on site. Please attach the diagram.

4. Provide pictures or drawings of each activity. Include a drawing of the unpaved/paved road network used to move loads "on" and "off" property.

5. Vehicle miles travels on unpaved roads associated with the activity (average speed).

6. Type of dust emitted at each source (coal, cement, sand, soil, clay, dust, etc.)

7. Estimate the size of the release area at which the activity occurs (square miles). For haul or dirt roads include total miles of road in use during the activity.

Description of Fugitive Dust Emission Controls on Site

Control strategies must be designed to meet 20% opacity or less on site (a lesser opacity may be defined by Approval Order conditions or federal requirements such as NSPS), and control strategies must prevent exceeding 10% opacity from fugitive dust at the property boundary (site boundary) for compliance with R307-309-3.

1. Types of ongoing emission controls proposed for each activity, each piece of equipment, and haul roads.

2. Types of additional dust controls proposed for bare, exposed surfaces (chemical stabilization, synthetic cover, wind breaks, vegetative cover, etc).

3. Method of application of dust suppressant.

4. Frequency of application of dust suppressant.

5. Explain what triggers the use of a special control measure other than routine measures already in place, such as covered loads or measures covered by a permit condition (increase in opacity, high winds, citizen complaints, dry conditions, etc).

6. Explain in detail what control strategies/measures will be implemented off-hours, i.e., Saturdays/Sundays/Holidays, as well as 6 PM to 6 AM each day.

Description of Fugitive Dust Control Off-site

Prevent, to the maximum extent possible, deposition of materials, which may create fugitive dust on public and private paved roads in compliance with R307-309-5, 6, 7.

1. Types of emission controls initiated by your operation that are in place "off" property (application of water, covered loads, sweeping roads, vehicle cleaning, etc.).

2. Proposed remedial controls that will be initiated promptly if materials, which may create fugitive dust, are deposited on public and private paved roads.

Submit the Dust Control Plan to:

Executive Secretary
Utah Air Quality Board
POB 144820
15 North 1950 West
Salt Lake City, Utah 84114-4820

Phone: (801) 536-4000
FAX: (801) 536-4099

Fugitive Dust Control Plan Violation Report

When a source is found in violation of R307-309-3 or in violation of the Fugitive Dust Control Plan, the course must submit a report to the Executive Secretary within 15 days after receiving a Notice of Violation. The report must include the following information:

1. Name and address of dust source.

2. Time and duration of dust episode.

3. Meteorological conditions during the dust episode.

4. Total number and type of fugitive dust activities and dust producing equipment within each operation boundary. If no change has occurred from the existing dust control plan, the source should state that the activity/equipment is the same.

5. Fugitive dust activities or dust producing equipment that caused a violation of R-307-309-3 or the sources dust control plan.

6. Reasons for failing to control dust from the dust generating activity or equipment.

7. New and/or additional fugitive dust control strategies necessary to achieve compliance with R307-309-3, 4, 5, 6, or 7.

8. If it can not be demonstrated that the current approved Dust Control Plan can result in compliance with R307-309-3 through 7, the Dust Control Plan must be revised so as to demonstrate compliance with 307-309-3 through 7. Within 30 days of receiving a fugitive dust Notice of Violation, the source must submit the revised Plan to the Executive Secretary for review and approval.

Submit the Dust Control Plan to:

Executive Secretary
Utah Air Quality Board
POB 144820
15 North 1950 West
Salt Lake City, Utah 84114-4820

Phone: (801) 536-4000
FAX: (801) 536-4099

Attachments: DFCM Form FDR R-307-309, Rule 307-309

CONTRACTOR'S AGREEMENT

FOR:

_____
_____
_____

THIS CONTRACTOR'S AGREEMENT, made and entered into this ____ day of _____, 20__, by and between the DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT, hereinafter referred to as "DFCM", and _____, incorporated in the State of _____ and authorized to do business in the State of Utah, hereinafter referred to as "Contractor", whose address is _____.

WITNESSETH: WHEREAS, DFCM intends to have Work performed at _____ _____.

WHEREAS, Contractor agrees to perform the Work for the sum stated herein.

NOW, THEREFORE, DFCM and Contractor for the consideration provided in this Contractor's Agreement, agree as follows:

ARTICLE 1. SCOPE OF WORK. The Work to be performed shall be in accordance with the Contract Documents prepared by _____ and entitled "_____."

The DFCM General Conditions ("General Conditions") dated May 25, 2005 on file at the office of DFCM and available on the DFCM website, are hereby incorporated by reference as part of this Agreement and are included in the specifications for this Project. All terms used in this Contractor's Agreement shall be as defined in the Contract Documents, and in particular, the General Conditions.

The Contractor Agrees to furnish labor, materials and equipment to complete the Work as required in the Contract Documents which are hereby incorporated by reference. It is understood and agreed by the parties hereto that all Work shall be performed as required in the Contract Documents and shall be subject to inspection and approval of DFCM or its authorized representative. The relationship of the Contractor to the DFCM hereunder is that of an independent Contractor.

ARTICLE 2. CONTRACT SUM. The DFCM agrees to pay and the Contractor agrees to accept in full performance of this Contractor's Agreement, the sum of _____ _____ DOLLARS AND NO CENTS ($_____.00), which is the base bid, and which sum also includes the cost of a 100% Performance Bond and a 100%

Payment Bond as well as all insurance requirements of the Contractor. Said bonds have already been posted by the Contractor pursuant to State law. The required proof of insurance certificates have been delivered to DFCM in accordance with the General Conditions before the execution of this Contractor's Agreement.

ARTICLE 3. TIME OF COMPLETION AND DELAY REMEDY. The Work shall be Substantially Complete by _____. Contractor agrees to pay liquidated damages in the amount of $_____ per day for each day after expiration of the Contract Time until the Contractor achieves Substantial Completion in accordance with the Contract Documents, if Contractor's delay makes the damages applicable. The provision for liquidated damages is: (a) to compensate the DFCM for delay only; (b) is provided for herein because actual damages can not be readily ascertained at the time of execution of this Contractor's Agreement; (c) is not a penalty; and (d) shall not prevent the DFCM from maintaining Claims for other non-delay damages, such as costs to complete or remedy defective Work.

No action shall be maintained by the Contractor, including its or Subcontractor or suppliers at any tier, against the DFCM or State of Utah for damages or other claims due to losses attributable to hindrances or delays from any cause whatsoever, including acts and omissions of the DFCM or its officers, employees or agents, except as expressly provided in the General Conditions. The Contractor may receive a written extension of time, signed by the DFCM, in which to complete the Work under this Contractor's Agreement in accordance with the General Conditions.

ARTICLE 4. CONTRACT DOCUMENTS. The Contract Documents consist of this Contractor's Agreement, the Conditions of the Contract (DFCM General Conditions, Supplementary and other Conditions), the Drawings, Specifications, Addenda and Modifications. The Contract Documents shall also include the bidding documents, including the Invitation to Bid, Instructions to Bidders/ Proposers and the Bid/Proposal, to the extent not in conflict therewith and other documents and oral presentations that are documented as an attachment to the contract.

All such documents are hereby incorporated by reference herein. Any reference in this Contractor's Agreement to certain provisions of the Contract Documents shall in no way be construed as to lessen the importance or applicability of any other provisions of the Contract Documents.

ARTICLE 5. PAYMENT. The DFCM agrees to pay the Contractor from time to time as the Work progresses, but not more than once each month after the date of Notice to Proceed, and only upon Certificate of the A/E for Work performed during the preceding calendar month, ninety-five percent (95%) of the value of the labor performed and ninety-five percent (95%) of the value of materials furnished in place or on the site. The Contractor agrees to furnish to the DFCM invoices for materials purchased and on the site but not installed, for which the Contractor requests payment and agrees to

safeguard and protect such equipment or materials and is responsible for safekeeping thereof and if such be stolen, lost or destroyed, to replace same.

Such evidence of labor performed and materials furnished as the DFCM may reasonably require shall be supplied by the Contractor at the time of request for Certificate of Payment on account. Materials for which payment has been made cannot be removed from the job site without DFCM's written approval. Five percent (5%) of the earned amount shall be retained from each monthly payment. The retainage, including any additional retainage imposed and the release of any retainage, shall be in accordance with UCA 13-8-5 as amended. Contractor shall also comply with the requirements of UCA 13-8-5, including restrictions of retainage regarding subcontractors and the distribution of interest earned on the retention proceeds. The DFCM shall not be responsible for enforcing the Contractor's obligations under State law in fulfilling the retention law requirements with subcontractors at any tier.

ARTICLE 6. INDEBTEDNESS. Before final payment is made, the Contractor must submit evidence satisfactory to the DFCM that all payrolls, materials bills, subcontracts at any tier and outstanding indebtedness in connection with the Work have been properly paid. Final Payment will be made after receipt of said evidence, final acceptance of the Work by the DFCM as well as compliance with the applicable provisions of the General Conditions.

Contractor shall respond immediately to any inquiry in writing by DFCM as to any concern of financial responsibility and DFCM reserves the right to request any waivers, releases or bonds from Contractor in regard to any rights of Subcontractors (including suppliers) at any tier or any third parties prior to any payment by DFCM to Contractor.

ARTICLE 7. ADDITIONAL WORK. It is understood and agreed by the parties hereto that no money will be paid to the Contractor for additional labor or materials furnished unless a new contract in writing or a Modification hereof in accordance with the General Conditions and the Contract Documents for such additional labor or materials has been executed. The DFCM specifically reserves the right to modify or amend this Contractor's Agreement and the total sum due hereunder either by enlarging or restricting the scope of the Work.

ARTICLE 8. INSPECTIONS. The Work shall be inspected for acceptance in accordance with the General Conditions.

ARTICLE 9. DISPUTES. Any dispute, PRE or Claim between the parties shall be subject to the provisions of Article 7 of the General Conditions. DFCM reserves all rights to pursue its rights and remedies as provided in the General Conditions.

ARTICLE 10. TERMINATION, SUSPENSION OR ABANDONMENT. This Contractor's Agreement may be terminated, suspended or abandoned in accordance with the General Conditions.

ARTICLE 11. DFCM'S RIGHT TO WITHHOLD CERTAIN AMOUNT AND MAKE USE THEREOF. The DFCM may withhold from payment to the Contractor such amount as, in DFCM's judgment, may be necessary to pay just claims against the Contractor or Subcontractor at any tier for labor and services rendered and materials furnished in and about the Work. The DFCM may apply such withheld amounts for the payment of such claims in DFCM's discretion. In so doing, the DFCM shall be deemed the agent of Contractor and payment so made by the DFCM shall be considered as payment made under this Contractor's Agreement by the DFCM to the Contractor. DFCM shall not be liable to the Contractor for any such payment made in good faith. Such withholdings and payments may be made without prior approval of the Contractor and may be also be prior to any determination as a result of any dispute, PRE, Claim or litigation.

ARTICLE 12. INDEMNIFICATION. The Contractor shall comply with the indemnification provisions of the General Conditions.

ARTICLE 13. SUCCESSORS AND ASSIGNMENT OF CONTRACT. The DFCM and Contractor, respectively bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement, and to partners, successors, assigns and legal representatives of such other party with respect to all covenants, provisions, rights and responsibilities of this Contractor's Agreement. The Contractor shall not assign this Contractor's Agreement without the prior written consent of the DFCM, nor shall the Contractor assign any moneys due or to become due as well as any rights under this Contractor's Agreement, without prior written consent of the DFCM.

ARTICLE 14. RELATIONSHIP OF THE PARTIES. The Contractor accepts the relationship of trust and confidence established by this Contractor's Agreement and covenants with the DFCM to cooperate with the DFCM and A/E and use the Contractor's best skill, efforts and judgment in furthering the interest of the DFCM; to furnish efficient business administration and supervision; to make best efforts to furnish at all times an adequate supply of workers and materials; and to perform the Work in the best and most expeditious and economic manner consistent with the interests of the DFCM.

ARTICLE 15. AUTHORITY TO EXECUTE AND PERFORM AGREEMENT. Contractor and DFCM each represent that the execution of this Contractor's Agreement and the performance thereunder is within their respective duly authorized powers.

ARTICLE 16. ATTORNEY FEES AND COSTS. Except as otherwise provided in the dispute resolution provisions of the General Conditions, the prevailing party shall be entitled to reasonable attorney fees and costs incurred in any action in the District Court and/or appellate body to enforce this Contractor's Agreement or recover damages or any other action as a result of a breach thereof.

IN WITNESS WHEREOF, the parties hereto have executed this Contractor's Agreement on the day and year stated hereinabove.

CONTRACTOR: _____

_____
Signature Date

Title: _____

State of _____)
)
County of _____) _____
Please type/print name clearly

On this ____ day of _____, 20____, personally appeared before me, _____, whose identity is personally known to me (or proved to me on the basis of satisfactory evidence) and who by me duly sworn (or affirmed), did say that he (she) is the _____ (title or office) of the firm and that said document was signed by him (her) in behalf of said firm.

_____
Notary Public

(SEAL)

My Commission Expires _____

APPROVED AS TO AVAILABILITY OF FUNDS:

_____
David D. Williams, Jr. Date
DFCM Administrative Services Director

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

_____
_____- Manager Date
Capital Development/Improvements

APPROVED AS TO FORM:
ATTORNEY GENERAL
November 30, 2006
By: Alan S. Bachman
Asst Attorney General

APPROVED FOR EXPENDITURE:

_____
Division of Finance Date

PERFORMANCE BOND

(Title 63, Chapter 56, U. C. A. 1953, as Amended)

That _____ hereinafter referred to as the "Principal" and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah, hereinafter referred to as the "Obligee, " in the amount of _____ _____ DOLLARS ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____, for the approximate sum of _____ _____ Dollars ($_____), which Contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall faithfully perform the Contract in accordance with the Contract Documents including, but not limited to, the Plans, Specifications and conditions thereof, the one year performance warranty, and the terms of the Contract as said Contract may be subject to Modifications or changes, then this obligation shall be void; otherwise it shall remain in full force and effect.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the state named herein or the heirs, executors, administrators or successors of the Owner.

The parties agree that the dispute provisions provided in the Contract Documents apply and shall constitute the sole dispute procedures of the parties.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the Provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20_____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____

(Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____

Attorney-in-Fact (Seal)

STATE OF _____)

) ss.

COUNTY OF _____)

On this _____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney in-fact of the above-named Surety Company and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____

Resides at: _____

_____

NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

DFCM FORM 1b 113006

PAYMENT BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____ _____, a corporation organized and existing under the laws of the State of _____authorized to do business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); with its principal office in the City of _____, hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah hereinafter referred to as the "Obligee," in the amount of _____ Dollars ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____ for the approximate sum of _____ _____ Dollars ($_____), which contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall pay all claimants supplying labor or materials to Principal or Principal's Subcontractors in compliance with the provisions of Title 63, Chapter 56, of Utah Code Annotated, l953, as amended, and in the prosecution of the Work provided for in said Contract, then, this obligation shall be void; otherwise it shall remain in full force and effect.

That said Surety to this Bond, for value received, hereby stipulates and agrees that no changes, extensions of time, alterations or additions to the terms of the Contract or to the Work to be performed thereunder, or the specifications or drawings accompanying same shall in any way affect its obligation on this Bond, and does hereby waive notice of any such changes, extensions of time, alterations or additions to the terms of the Contract or to the Work or to the specifications or drawings and agrees that they shall become part of the Contract Documents.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____

(Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____

Attorney-in-Fact (Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, 20____, personally appeared before me _____ _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____

Resides at: _____

_____

NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

DFCM FORM 1b 113006

CHANGE ORDER #_____

CONTRACTOR:

ARCHITECT:

AGENCY OR INSTITUTION:
PROJECT NAME:
PROJECT NUMBER:
CONTRACT NUMBER:
DATE:

CONSTRUCTION CHANGE DIRECTIVE NO.	PROPOSAL REQUEST NO.	AMOUNT		DAYS	
		INCREASE	DECREASE	INCREASE	DECREASE

	Amount	Days	Date
ORIGINAL CONTRACT			
TOTAL PREVIOUS CHANGE ORDERS			
TOTAL THIS CHANGE ORDER			
ADJUSTED CONTRACT			

DFCM and Contractor agree that the terms, contract sum, scope of the Work and time specified in this Change Order shall constitute the full accord and satisfaction, and complete adjustment to the Contract and includes all direct and indirect costs and effects related to, incidental to, and/or reasonably implied from such change in the contract terms, sum, scope of the Work and time.

Contractor:_____
Date

Architect/Engineer:_____
Date

Agency or Institution:_____
Date

DFCM: _____
Date

Funding Verification:_____
Date

CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT _____ PROJECT NO: _____
AGENCY/INSTITUTION _____

AREA ACCEPTED _____

The Work performed under the subject Contract has been reviewed on this date and found to be Substantially Completed as defined in the General Conditions; including that the construction is sufficiently completed in accordance with the Contract Documents, as modified by any change orders agreed to by the parties, so that the State of Utah can occupy the Project or specified area of the Project for the use for which it is intended.

The DFCM - (Owner) accepts the Project or specified area of the Project as Substantially Complete and will assume full possession of the Project or specified area of the Project at _____ (time) on _____ (date).

The DFCM accepts the Project for occupancy and agrees to assume full responsibility for maintenance and operation, including utilities and insurance, of the Project subject to the itemized responsibilities and/or exceptions noted below:

_____

_____

The Owner acknowledges receipt of the following closeout and transition materials:

☐ As-built Drawings ☐ O & M Manuals ☐ Warranty Documents ☐ Completion of Training Requirements

A list of items to be completed or corrected (Punch List) is attached hereto. The failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents, including authorized changes thereof. The amount of _____(Twice the value of the punch list work) shall be retained to assure the completion of the punch list work.

The Contractor shall complete or correct the Work on the list of (Punch List) items appended hereto within _____ _____calendar days from the above date of issuance of this Certificate. The amount withheld pending completion of the list of items noted and agreed to shall be: $_____. If the list of items is not completed within the time allotted the Owner has the right to be compensated for the delays and/or complete the work with the help of independent contractor at the expense of the retained project funds. If the retained project funds are insufficient to cover the delay/completion damages, the Owner shall be promptly reimbursed for the balance of the funds needed to compensate the Owner.

_____	by:	_____	
CONTRACTOR (include name of firm)		(Signature)	DATE
_____	by:	_____	
A/E (include name of firm)		(Signature)	DATE
_____	by:	_____	
USING INSTITUTION OR AGENCY		(Signature)	DATE
_____	by:	_____	
DFCM (Owner)		(Signature)	DATE

4110 State Office Building, Salt Lake City, Utah 84114 cc: Parties Noted
telephone 801-538-3018 • facsimile 801-538-3267 • http://dfcm.utah.gov DFCM, Director

SUMMARY OF WORK
SECTION 01100 -

PART 1 - GENERAL

SUMMARY

1.1

Section Includes:

A.

Definitions.

1.

2. Work covered by Contract Documents.
3. Contractor use of site and premises.
4. OWNER occupancy.

DEFINITIONS

1.2

Furnish: Purchase and deliver to project site, ready for installation.

A.

Install: Unpack, assemble, set in final position, fasten in place, make final connections, clean,

B.

adjust, and leave ready for use.
Provide: Furnish and install.

C.

Receive: Accepting a delivery. (Entity responsible for accepting a delivery.)

D.

Final Connections: Complete plumbing, mechanical, and electrical connections as required and

E.

recommended by manufacturer for optimum operation of equipment.

WORK COVERED BY CONTRACT DOCUMENTS - BASE BID

1.3

A. Payment shall include all costs to (a) **provide mobilization** for all materials, employees and equipment to the jobsite, (b) locate all buried utilities, lines and features ahead of the excavation ("down-time" required to locate and determine the appropriate course to avoid the line(s) and the "downtime" necessary for the utility company(ies) to determine the method of relocation and the time actually required to relocate the utility is included in the payment item),

B. **Install the sprinkler system complete at the CEMETERY.**(a) locate by flags or other methods the location of each NEW sprinkler head, (b) remove the lawn sod with a sod-cutter along the path of each sprinkler line, (c) complete the trenching and auguring for the pipe installation, (d) **install all pipe, fittings, sprinklers and risers for the system construction**, (e) backfill the trench with sand, (f) compact the trench backfill and restore the surface lawn sod, (g) install the manifold valves with all fittings as shown on the drawings, (h) install the manifold valve box cover and backfill to final grade, (i) construct the well head improvements by removing the existing pipe and cover and installing the new pipe, cover, well seal, vents and backfill as needed to complete the well head improvements, (j) **install a new submersible pump** with cable and support discharge galvanized OR HDPE pipe and support chain, (k)

Install the well discharge piping from the well head to the tank including trenching, auguring, lawn sod removal and replacement, (l) install the electrical system connections including the well head junction box, electrical conduit between the well head and the pump control panel at the pump vault including trenching and auguring as needed and making the connections to the pump control panel, (m) **installing the booster pump** in the pump vault after removing the existing pump vault and equipment, and installation includes all suction and discharge pipe, foot valves, fittings, gauges, electrical cutoff switches for low pressure and over pressure, and installing the pressure relief valve, (n) connecting the system zone valves to the new TORO controller, (o) connecting the cutoff switches to the NEW booster pump relay control, (p) **install the new 10,000 gallon fiberglass reinforced plastic water storage tank** including excavation and disposal of excess excavated materials, manway access with cast iron ring and lid, pump control level electrodes, tank vent, system connections for the inlet and suction lines, and backfill with sand and compaction.

Payment also includes preparing As-Built drawings, preparing an Operations and Maintenance manual and initial training of the Owner for operation and maintenance of the system. The Payment also includes adjustments of the sprinkler heads after a 30 day operations cycle as requested by the owner.

Payment shall all costs to (a) cut down the identified trees, grind the stump to 18 inches below the surface and legally disposed of the grindings, trunk, limps and waster materials. Payment included backfilling the excavated stump area with suitable top soil material and planting lawn sod cover.

Payment includes all work necessary to provide final cleanup of the work area, staging areas, repair to any damaged fences, parking surfaces, trees, shrubs and other improvements. The documentation of the pre-construction site by photographs and/or video recordings is included in the payment item..

C. **Install the vault, pumps and piping at the Camp Floyd Cemetery.**

(A) Install the booster pump precast concrete vault with the double leaf access hatch including removing the existing vault and legally disposing of the vault, and then installing the new vault, (b) installing the booster pump in the vault, installation includes all suction and discharge pipe, foot valves, fittings, gauges, electrical cutoff switches for low pressure and over pressure, and installing the pressure relief valve, (c) installing the new electrical service panel, new pump control panel, new sprinkler zone controller, new pump start relay and connecting the system zone valves to the new controller, (d) connecting the cutoff switches to the new booster pump relay control, (e) install the new pump control level electrodes in the new 10,000 gallon water storage tank including excavation and placement of conduit and cable. Payment includes excavation and removal of the existing 10,000 gallon tank and legal disposal of the tank. Payment includes the installation of new suction and discharge lines.

Payment also includes preparing As-Built drawings, preparing an Operations and Maintenance manual and initial training of the Owner for operation and maintenance of the system. The Payment also includes adjustments of the sprinkler heads after a 30 day operations cycle as requested by the owner.

Payment includes all work necessary to provide final cleanup of the work area, staging areas, repair to any damaged fences, parking surfaces, trees, shrubs and other improvements. The documentation of the pre-construction site by photographs and/or video recordings is included in the payment item..

D. **Install the 44 gallon booster pressure pump and yard hydrant system**. Payment includes (a) installing the booster pump and pressure tank in the pump vault, (b) connecting the motor to the service panel through a convenience outlet or as required, (c) installing the discharge pipe from the pump to each of the three (3) yard hydrants including trench excavation, backfill and sod restoration, (d) installing the three (3) yard hydrants as shown on the drawings.

1.4 WORK COVERED BY ALTERNATE BID ITEMS

Alternate Item #1 -Stump removal. Payment shall be at the unit price bid and shall include all costs to grind the stump to 18 inches below the surface and legally disposed of the grindings. Payment included backfilling the excavated stump area with suitable top soil material and planting lawn sod cover

Alternate Item #2 -Flag Pole lighting. Payment shall be at the lump sum price bid and shall include all costs necessary to complete the work including (a) remove the lawn sod with a sod-cutter along the path of electrical line, (b) complete the trenching and auguring for the conduit installation, (c) install all conduit, fittings, #12-2 w/g wire and water proof junction boxes for the installation of a convenience outlets and flag pole lighting, (d) connecting the circuit to the new electrical service panel, (e) installing the direct burial flag pole light (90 watt).

1.5 CONTRACTOR USE OF SITE AND PREMISES

Limit use of site to allow for:

A.

1. OWNER occupancy including required maintenance of existing landscape and facilities.
2. Use of site and premises by the public will be restricted to the Museum, Inn, Restrooms, and Private remembrances at the Cemetery.

Do not unreasonably encumber site with products or equipment.

B.

Be responsible for maintaining the following conditions at all times during the construction period

C.

until possession date by OWNER.

1. Maintain visitor parking
2. Maintain reasonable access to the restrooms.

1.6 OWNER OCCUPANCY

OWNER may occupy any completed or partially completed portions of the Work.

A.

Cooperate with OWNER to minimize conflict, and schedule the Work to facilitate OWNER's

B.

operations.

Prior to OWNER occupancy, ensure that the following conditions have been met:

C.

System training has been completed

1.
2. Operations and maintenance manual has been provided.
3. Lawn sod has been restored.
4. Entire system improvements have been cycled and shown to be functioning properly.
5. Warranty information has been provided to the OWNER.

After OWNER occupancy:

D.

Adjust sprinkler spray patterns up to 30 days after owner acceptance.

1.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01280

MEASUREMENT

PART 1 GENERAL

1.1 DEFINITIONS

A.

1.2 GENERAL MEASUREMENT OF QUANTITIES

A. All work completed under the Contract will be measured lump sum units. The bid documents will generally define the scope of work to be accomplished within each lump sum bid item and may provide general quantity amounts for assistance in determining the extent to the work. The total lump sum measurement will assume that all work and materials necessary to complete the described task will be included in the amounts bid.

PART 2 PRODUCTS Not used.

PART 3 EXECUTION Not used.

END OF SECTION

SECTION 01282

PAYMENT

PART 1 GENERAL

1.1 RELATED SECTIONS

A. Section 01100: Summary of Work

B. Section 01280: Measurement.

1.2 SCOPE OF PAYMENT

A. OWNER will fully compensate CONTRACTOR as provided in the Contract for:
   1. Furnishing all materials, labor, equipment, tools, transportation, mobilization and incidentals required for completion of the work.
   2. All loss or damage due to the nature of the work, action of the elements and unforeseen difficulties until final acceptance by the OWNER, subject to the provisions of Section 00725, paragraph: CONTRACTOR's Responsibility for Work.
   3. All costs arising from any infringement of a patent, trademark, or copyright.

B. Lump sum: Complete payment for the work described in the Contract when used as an item of payment.

C. CONTRACTOR will not be paid for:
   1. Work that is in excess of that contained in the Contract.
   2. Removal and replacement of defective work.
   3. Loss of anticipated profits.

D. Neither partial payment nor release of retainage will relieve the CONTRACTOR of the obligation to correct all defective work or materials.

1.3 ALTERED QUANTITIES

A. By Change Order only.

1.4 DIFFERING SITE CONDITIONS, CHANGES, EXTRA WORK

A. OWNER will pay for differing site conditions, changes, and extra work performed under Section 00725 at unit price or lump sum as stipulated in the order authorizing the work.

1.5

1.6 ELIMINATED ITEMS

A. If any items contained in the Contract are determined to be unnecessary, the ENGINEER will eliminate the items from the Contract with a Change Order to the CONTRACTOR. This action will not invalidate the Contract.

B. When a CONTRACTOR is notified of eliminated items, OWNER will reimburse for actual work done under the provisions of Section 01282, paragraph: Differing Site Conditions, Changes, Extra Work; and paragraphs concerning Force Account Work (General, Labor, Materials, CONTRACTOR-Owned Equipment, Rented or Leased Equipment, Subcontracts, Compensation).

1.7 PROGRESS PAYMENTS

A. OWNER will make progress payments at least once each month when the work is progressing.

B. More frequent payments may be made during any period when the OWNER determines that the value of work performed during the period is of sufficient amount to warrant a payment.

C. Payments will be based on estimates prepared by the ENGINEER of the value of the work performed and materials in place under the Contract and for materials delivered under this Section, paragraph: Payment for Material on Hand.

D. OWNER will make no progress payment when the total value of the work done since the last estimate is less than $1,000.

E. From the total of the payable amounts, the OWNER will deduct and retain 5 percent until after the entire Contract has been completed in an acceptable manner. When no less than 95 percent of the work has been completed, and with the consent of the Surety, the ENGINEER may prepare a semi-final estimate from which the OWNER will retain 1-1/2 percent of the original contract amount. The OWNER will certify the remainder for payment, less all previous payments.

F. The CONTRACTOR may enter into an addendum agreement providing for the payment of retained monies into an escrow account, or the OWNER will do so automatically.
   1. These monies are to be applied toward the purchase of approved securities that are to be held by an escrow agent until satisfactory completion of the construction Contract.
   2. The value of the securities placed in escrow will have a minimum value equal to or greater than the amount that would otherwise be retained.
   3. The addendum agreement must be executed concurrently with the execution of the construction Contract. Agreement forms are available in the office of the OWNER's Engineer for Construction and Materials.

1.8 PAYMENT FOR MATERIAL ON HAND

A. When the CONTRACTOR presents delivery copies of invoices, the OWNER may include in the partial payment invoice, advance payments for acceptable nonperishable

materials purchased expressly to be incorporated into the work when delivered in the vicinity of the project, or stored in approved storage place.

1. The ENGINEER will determine the amount to be included in the estimate, but in no case will the amount exceed the value of the materials as shown on the delivery invoice, or 75 percent of the in-place price, whichever is less.
2. When the approved storage location is other than the project site, furnish evidence that the stockpiled materials are irrevocably obligated to the project.
3. Payment will not be made when the invoice value of such materials, as determined by the ENGINEER, amounts to less than $2,000 or if materials are to be stored less than 30 calendar days.
4. Within 60 calendar days following the date of the estimate invoice on which the stockpile material is to be paid by the OWNER, furnish to the ENGINEER certified paid invoices or a certified statement with a copy of the check showing payment.
5. The material will be removed from the next partial estimate as stockpiled materials if proper invoices showing payment to the supplier is not received.

B. OWNER will make no partial payment on living or perishable materials until incorporated as specified in the Contract.

C. OWNER will make no payment for materials brought onto the site at the CONTRACTOR's election that may be incorporated into the project such as fuels, supplies, metal decking forms, ties, or supplies used to improve efficiency of operations.

D. Approval of partial payment for stockpiled materials will not constitute final acceptance of such materials for use in completing items of work.

E. OWNER will purchase at actual cost and without any percentage allowance for profit, materials delivered to the project in compliance with the Contract or left unused due to changes in plans or variation in quantities, if the materials are not practicably returnable for credit.

1. Purchased materials will become the property of the OWNER.
2. Actual costs will be based on invoice price plus transportation costs to the work.

F. Payment will be limited to contract quantities unless ordered by the ENGINEER. Assume responsibility for excess materials delivered to the project, or aggregate produced beyond the contract amount without authority from the ENGINEER.

1.9 ACCEPTANCE AND FINAL PAYMENT

A. When the project has been accepted as provided in Section 00727, paragraph: Project Acceptance - Partial, and paragraph: Project Acceptance - Final, the ENGINEER will prepare the final estimate of work performed.

1. If the CONTRACTOR approves the final estimate or does not object to the quantities within 30 calendar days of receiving the final estimate, the OWNER will process the estimate for final payment.

2. After approval of the final estimate by the CONTRACTOR, OWNER will pay for the entire sum due after deducting all previous payments and all amounts to be retained or deducted under the provisions of the Contract.

B. If additional payment is due from the OWNER, file with the OWNER a full, complete, and itemized written statement justifying the adjustment within 30 calendar days after the final estimate is submitted for approval.
   1. All disputes not itemized in said statement are waived by the CONTRACTOR.
   2. Submission of disputes by the CONTRACTOR will not be reason for withholding full payment of the total value of work shown on the ENGINEER's final estimate.
   3. The OWNER will evaluate the dispute. If it is determined that additional payment is due, the final estimate will be revised accordingly, under the terms of the Contract. If not, the estimate as submitted will be final.

C. All prior partial estimates and payments will be subject to correction in the final estimate and payment.

D. The OWNER will have the final estimate complete and to the CONTRACTOR within six months of when the CONTRACTOR meets substantial completion of the project and has supplied the ENGINEER with all project certifications.

PART 2 PRODUCTS Not used.

PART 3 EXECUTION Not used.

END OF SECTION

SECTION 01741

FINAL CLEANUP

PART 1 GENERAL

1.1 SECTION INCLUDES

E. Finish and clean all areas disturbed by construction.

PART 2 PRODUCTS Not used.

PART 3 EXECUTION

3.1 CLEANING PROCEDURES

A. Clean all liter, debris, waste materials and similar items from the lawn, parking, staging areas and all other areas occupied during construction.
B. Only use equipment with pneumatic tires on the lawn sod surface.
C. Within existing drainage ditches: clean all debris and obstructions and dispose of material removed.
D. On lawn sod, remove excess waste soils and lawn sod remnants.

END OF SECTION

SECTION 02810 - IRRIGATION SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes valves, piping, sprinklers, specialties, accessories, controls, and wiring for irrigation systems.

B. Field verify capacity of the existing secondary irrigation system complete including but not limited to flow, capacity and etc.

C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section 01100 Scope of Work.
2. Specification Section - Soils Report for reference only.
3. Division 2 Section 02900 Landscape Planting.
4. Division 16 Sections for electrical power materials and installations.

1.3 DEFINITIONS

A. Piping sizes used in this Section are normal pipe size (NPS) in inches. Tube sizes are standard size in inches. Equivalent SI (metric) sizes are indicated in millimeters (mm) in parentheses.

B. Supply Piping: Piping from water source to connection to irrigation system pressure piping. Piping is under same pressure as water supply. Piping in this category is not included in this Section.

C. Pressure Piping: Piping downstream from supply piping to and including control valves. Piping is under irrigation system pressure. Piping in this category includes pressure regulators, water meters, and backflow preventers, when used.

D. Circuit Piping: Piping downstream from control valves to irrigation system sprinklers, emitters, devices, and drain valves. Piping is under pressure (less than pressure piping) during flow.

E. Control Valve: Manual or automatic (electrically operated) valve for control water flow to irrigation system zone, including isolation or zone valves.

F. Drain Piping: Downstream from circuit or pressure piping drain valves. Piping is not under pressure.

G. Drain Valve: Manual drain valve for draining of irrigation system circuit piping.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. Location of Sprinkler and Devices: Design location is approximate. Make minor adjustments necessary to avoid planting and obstructions such as signs and light standards.

B. Minimum Water Coverage: Not less than:
   1. Turf Areas: 100 percent.
   2. Other Planting Areas: 100 percent.

C. Components and Installation: Capable of producing piping systems with the following minimum working pressure ratings except where indicated otherwise.
   1. Pressure Piping: 150 psig (1035 kPa).
   2. Circuit and Drain Piping: 100 psig (690 kPa).

1.5 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data including pressure rating, rated capacity, settings, and electrical data of selected models for the following:
   1. Pressure regulators.
   2. Valves, including general-duty, underground, manual and automatic control, and quick- coupler types, and valve boxes.
   3. Sprinklers, including emitters, drip tubes, and devices.
   4. Controls, including controller wiring diagrams.
   5. Wiring.
   6. Pipe, including sleeves, lateral, supply, conduit and drain.
   7. Filter Assembly.

C. Wiring diagrams for electrical controllers, valves, and devices.

D. Maintenance data for inclusion in "Operating and Maintenance Manual" specified in Division 1 Section "Project Closeout" for the following:
   1. Pressure regulators.
   2. Automatic control valves.
   3. Sprinklers.
   4. Controllers.
   5. Central Control Equipment.
   6. Filter Assembly.

1.6 QUALITY ASSURANCE

A. Comply with requirements of utility supplying water for prevention of backflow and backsiphonage.

B. Comply with requirements of authority with jurisdiction for irrigation systems.

C. Installer Qualifications: Engage an experienced “Installer” who has completed minimum of 6 irrigation systems similar in material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.

D. Listing/Approval Stamp, Label, or Other Marking: On equipment, specialties, and accessories made to specified standards.

E. Listing and Labeling: Equipment, specialties, and accessories that are listed and labeled.
   1. The Terms "Listed" and "Labeled": As defined in "National Electrical Code," Article 100.
   2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

F. Product Options: Irrigation system piping, specialties, and accessories are based on specific types, manufacturers, and models indicated. Components with equal performance characteristics produced by other manufacturers may be considered, provided deviations in dimensions, operation, and other characteristics do not change design concept or intended performance as judged by the Architect, unless noted "No Substitute". The burden of proof of product equality is on the Contractor. Refer to Division 1 Section "Product Substitutions." No requests for substitutions will be reviewed after bids have been received by Owner.

1.7 PROJECT CONDITIONS

A. Perform site survey, research public utility records, and verify existing utility locations. Verify that irrigation system piping may be installed in compliance with original design and referenced standards.

B. Site Information: Reports on subsurface condition investigations made during design of the Project are available for informational purposes only; data in reports are not intended as representations or warranties of accuracy or continuity of conditions (between soil borings). Owner assumes no responsibility for interpretations or conclusions drawn from this information.

1.8 SEQUENCING AND SCHEDULING

A. Maintain uninterrupted water service to building during normal working hours. Arrange for temporary water shutoff with Owner.

B. Coordinate irrigation systems work with landscape work specified in Division 2 Section 02900 Landscape Planting.

1.9 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials matching products installed as described below. Package them with protective covering for storage and label clearly describing contents.

   1. Quick Couplers: Furnish quantity of units equal to 10% of amount of each size installed, but not less than 1.
   2. Sprinklers: Furnish quantity of units equal to 10% of amount of each type installed, but not less than 10.

3. Dripper Tube: Furnish quantity of units equal to 10% of amount of each type installed.
4. Valve Keys: Furnish quantity of tee-handle--units equal to 25% of amount of each type key-operated, control valve installed, but not less than 2 each.
5. Quick Coupler Hose Swivels: Furnish quantity of units equal to 25% of amount of each type quick coupler installed, but not less than 2.
6. Quick Coupler Operating Keys: Furnish quantity of units equal to 25710 of amount of each type quick coupler installed, but not less than 3. ;

1.1 0 WARRANTY/GUARANTEE

A. During the period of one (1) year from and after the final acceptance of the completed irrigation system, the Contractor shall at his own expense, make all needed repairs or replacement due to defective workmanship or materials which in the judgement of the Owner or Owner's representative, shall become necessary during such period. If, within seven (7) calendar days after mailing of the written notice or verified communication by the Owner to the Contractor or his agent, requesting such repairs or replacement, the Contractor shall neglect to make repairs, Owner may make such repairs at the Contractor's expense. In the case of emergency where, in the judgement of the Owner, delay could cause serious loss, hazard or damage to persons or property, then repairs, replacement and security, both temporary and/or permanent, may be provided by such persons as the Owner may employ, after verbal communication with Contractor without notice being sent to the Contractor, and the Contractor shall pay all costs related thereto.

B. The guarantee shall be in the form of a letter from the Contractor addressed to the Owner. The letter shall incorporate the language stated above and be signed by an authorized officer/agent or Owner of the Contractor.

C. During the guarantee period, the Contractor will drain the system in the fall and put the system back into operation in the Spring. This work shall be done in the presence of the Owner's representative and maintenance personnel.

1.11 RECORD DRAWINGS:

A. Any deviation from plan layout should be indicated on the final "Record" Drawings. This Contractor shall make an exact measured and dimensioned drawing showing locations of all piping, wiring, control, valves and quick coupler valves.

B. Record Drawings shall be furnished to the Landscape Architect at the time of Substantial Completion Inspection before a letter of Substantial Completion for the irrigation sprinkler system will be issued.

C. The Contractor shall supply the Landscape Architect with record drawing information in AutoCadd format before final acceptance of the irrigation system.

1.12 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver irrigation system components in manufacturer's original undamaged and unopened containers with labels intact and legible.

B. Deliver plastic piping in bundles, packaged to provide adequate protection of pipe ends, both threaded or plain.

C. Store and handle materials to prevent damage and deterioration.

D. Provide secure, locked storage for valves, sprinkler heads, and similar components that cannot be immediately replaced, to prevent installation delays.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Pressure Regulators
   a. Bermad.
   b. Conbraco Industries, Inc.
   c. Honeywell Braukmann.
   d. Watts Regulator Co. .
   e. Wilkins Regulator Div., Zurn Industries, Inc.

2. Gate Valves for Underground Installation:
   a. American Darling Valve Div., American Cast Iron Pipe Co.
   b. Clow Valve Co. Div., McWane, Inc.
   c. Kennedy Valve Div., McWane, Inc. d. Stockham Valves & Fittings, Inc.
   e. Waterous Co.

3. Corporation Stops for Underground Installation
   a. Ford Meter Box Co., Inc.
   b. Hays Div., Romac Industries.
   c. A.Y. McDonald Mfg. Co.
   d. Mueller Co., Grinnell Corp.

4. Valves for Aboveground and Pit Installation
   a. Grinnell Supply Sales Co., Grinnell Corp.
   b. Nibco, Inc.
   c. Stockham Valves & Fittings, Inc.
   d. Walworth Co.
   e. Watts Regulator Co.

5. Automatic Control Valves
   a. Rain Bird Sprinkler Mfg. Corp.
   b. Toro Co.

6. Control Valve Boxes
    a. Ametek by Plymouth Products Div., AMETEK
    b. Brooks Products, Inc., Polyplastics Div.
    c. Carson Industries, inc.
    d. DFW/HPI by Hefco Plastics, Inc.
    e. National Diversified Sales, Inc.
7. Quick Couplers
    a. Toro Co.

8. Sprinklers
    a. Toro Co.

9. Controllers
    a. Toro Co.

10. Pipe
    a. Pacific Western Extruded Plastics Co.
    b. Eagle Pacific Industries, Inc.
    c. J-M Manufacturing Company, Inc.

11. Filter Assembly a. Amiad Filtration Systems b. Action Filters

2.2 PIPES AND TUBES

A. Refer to Part 3 Article "Piping Applications" for identification of systems where pipe and tube materials specified below are used.

B. Polyvinyl Chloride (PVC) Plastic Pipe: ASTM 0 1785, PVC 1120, Schedule 40, 160 psig (1100 kPa) minimum pressure rating for 3-inch (100-mm) and smaller sizes, ,with plain, threaded or bell ends.

    1. PVC Socket Fittings: Schedule 40: ASTM 0 2466.

C. Polyvinyl Chloride (PVC) Plastic Pipe': ASTM 0 1785, PVC 1120 compound, Schedule 80.

    1. PVC Socket Fittings: Schedule 80: ASTM 02467.

    2. PVC Threaded Fittings: Schedule 80: ASTM 0 2464.

D. PVC, Pressure-Rated Pipe: ASTM 02241, PVC 1120 compound, SOR 21 Bell and Ring for pipe 4" and larger.

2.3 PIPE AND TUBE FITTINGS

A. Refer to Part 3 Article "Piping Applications" for identification of systems where pipe and tube fitting materials specified below are used.

B. Cast-Bronze Flanges: ASME B16.24, Class 150, raised ground face, bolt holes spot faced.

C. Polyvinyl Chloride (PVC) Plastic Pipe Fittings: ASTM 02467, Schedule 80, socket-type and ASTM 02464, Schedule 80, threaded fittings.

D. Polyvinyl Chloride (PVC) Plastic Pipe Fittings: ASTM 02467, Schedule 40, socket-type and ASTM 02464, Schedule 40, threaded fittings.

E. Polyvinyl Chloride (PVC) Plastic Pipe Fittings: ASTM 02241, PVC 1120 compound, SOR 21. Polyvinyl Chloride (PVC) Plastic Pipe Fittings: ASTM 02467, Schedule 40, socket-type. .

2.4 JOINING MATERIALS

A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for joining materials not included in this Section.

B. Solvent Cement: ASTM F656 primer and ASTM 02564 solvent cement in color other than orange.

C. Gaskets for Plastic Flanged Joints: Materials recommended by plastic pipe and fittings manufacturer.

2.5 VALVES

A. General: Valves are for general-duty and underground applications. Refer to "Valve Applications" Article for locations of various valve types specified in this Article. Refer to "Control Valves" Article for control valves and accessories and "Backflow Preventers" Article for backflow preventer valves.

B. Nonrising Stem Gate Valves 3-inches (ON 80) and Larger: AWWA C500, cast-iron double disc, bronze disc and seat rings or AWWA C509, resilient seated; bronze stem, cast-iron, or ductile iron body and bonnet, stem nut, 200 psig (1380 kPa) working pressure; and ends that fit NPS dimension, PVC pipe. Include elastomeric gaskets.

C. Valve Boxes: Cast-iron box with top section and cover with lettering "WATER," bottom section with base to fit over valve and barrel approximately 5-inches (127 mm) in diameter, and adjustable cast-iron extension of length required for depth of bury of valve.

1. Provide steel tee-handle shutoff rod with each valve box. Include tee-handle, shutoff rod with one pointed end, stem of length to operate valve, and end fitting valve operating nut.

D. Curb Stops 2-inches (ON 50) and Smaller: Bronze body, ground key plug or ball, 150 psig (1035 kpa) minimum pressure rating, wide tee head, with inlet and outlet to match service piping material.

E. Service Boxes for Curb Stops: Cast-iron box with telescoping top section of length required for depth of bury of valve. Include cover with lettering "WATER" and bottom section with base of size to fit over curb stop and barrel approximately 3-inches (75 mm) in diameter.

1. Provide steel tee-handle shutoff rod with each service box. Include tee-handle, shutoff rod with one pointed end, stem of length to operate curb stop, and slotted end fitting curb stop head.

F. Bronze, Nonrising Stem Gate Valves, 2-inches (ON 50) and Smaller: MSS SP-80, Type 1, solid wedge; nonrising, copper-silicon-alloy stem; Class 125, body and screw bonnet of ASTM B 62 cast bronze, with threaded or solder-joint ends. Include polytetrafluoroethylene (PTFE) impregnated packing, brass packing gland, and malleable-iron handwheel.

G. Plastic Valves: Polyvinyl Chloride (PVC) Plastic, with 150 psig (1035 kPa) minimum pressure rating, ends compatible to piping where valve is to be installed, and tee handle.

H. Ball Valves: Ball valves shall be solid bronze meeting Federal Specification WW-V-35C, TYPE II, COMPOSITION: BZ, STYLE: 3. Size shall be the same size as the main line on which it is installed. Valves shall be installed on the up-stream side of the electric remote control valve manifold and in the same valve box. NOTE: Only one (1) ball valve required per manifold.

I. Drain Valves: All drain valves shall be 0/," brass full turn ball cocks and installed as per details on the Drawings. Valves shall be tested for 150 psi working pressure. This valve is to be installed on mainlines only.

2.6 CONTROL VALVES

A. Description: Manufacturer's standard control vales for circuits, of type and size indicated, and as follows:
1. Provide cast-bronze bodies, unless otherwise indicated.
2. Manual Control Valves: MSS SP-80, Class f25, gl05e valves.
3. Key-Operated, Manual Control Valves: MSS Sp-80, Class 125, globe valves, fitted for key operation.
4. Automatic Control Valves: Diaphragm-type, normally closed, with manual flow adjustment, and operated by 24-volt-a.c. solenoid. i.
5. Automatic Drain Valves: Designed to open for drainage when line pressure drops below 3 psig (20 kpa). Not for use on pressure piping.
6. Quick-Couplers: Factory-fabricated, 2-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, %-11.5NH Threads for garden hose on outlet; and operating key.
   a. Locking Top Option: Include vandal-resistant, locking feature with two matching keys.

B. Control Valve boxes: Polyethylene (PE), acrylonitrile-butadiene-styrene (ABS), fiber-glass, polymer concrete, or precast concrete box and cover. Size as required for application.

1. Drainage Backfill: Cleaned gravel or crushed stone, graded form 3-inches (75 mm) maximum to %-inch (19 mm) minimum.

2. Valve boxes shall be of sufficient size to house two (2) electric remote control valves with unions, and still allow room for maintenance without having to excavate or perform similar operations. Boxes shall have lock down lids and shall meet ASTM D638 for tensile strength of 4,300 pounds per square inch.

C. Service Boxes for Key-Operated Control Valves: Cast-iron box with telescoping top section of length required for depth of bury of valve. Include cover with lettering "WATER," and bottom section with base of size to fit over curb stop and barrel approximately 3-inches (75 mm) in diameter.

1. Include valve key, 36-inches (915 mm) long with tee handle and key end to fit valve.

2.7 SPRINKLERS

A. Description: Manufacturer's standard sprinklers designed to provide uniform coverage over entire area of spray shown on Drawings at available water pressure, as follows:

1. Housings: plastic, except where material is specified.
2. Pop-up, Spray: Fixed pattern, with screw-type flow adjustment and stainless steel retraction spring.
3. Pop-up, Rotary Spray: Gear drive, full-circle and adjustable part-circle type.
4. Bubblers: Fixed pattern, with screw type flow adjustment.

2.8 AUTOMATIC CONTROL SYSTEM

A. Description: Low-voltage controller system, made for control of irrigation system automatic control valves. Controller operates on 120 volts a.c. building power system, provides 24 volts a.c. power to control valves.

B. Exterior Control Enclosures: Weatherproof enclosure with locking cover and two matching keys. Enclosure construction complies with NFPA 70 and NEMA 250, Type 4, and includes provision for grounding.

1. Material: Enameled-steel, sheet metal.

C. Transformer: Internal-type, and suitable for converting 120 volts a.c. building power to 24 volts a.c. power.

D. Controller Stations for Automatic Control Valves: Include switch for manual or automatic operation of each station.

E. Timing Device: Adjustable, 24-hour, 14-day clock to operate any time of day. See Irrigation Schedule and Legend for model and manufacturer.

F. Lightning Protection: Provide manufacturer's standard lightning protection on each controller. Coordinate with electrical.

G. Wiring: UL 493, solid copper conductor, insulated cable, suitable for direct burial.

1. Feeder Circuit Cables: Type UF, No. 14 AWG minimum, between valves and controllers.

H. Valve wire sizing chart: See Appendfx A at end of section.

2.9 IDENTIFICATION

A. Refer to Division 2 Section "Earthwork" for plastic underground warning tapes.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Investigate and determine available water supply, water pressure and flow characteristics.

3.2 PREPARATION

A. Set stakes or flags to identify proposed sprinkler locations. Obtain OWNER's approval before excavation.

3.3 PAVING WORK

A. No paving restoration is anticipated for this project.

3.4 PIPING APPLICATIONS

A. Refer to Part 2 of this Section for detailed specifications for pipe and fittings products listed below. Use pipe, tube, fittings, and joining methods according to the following applications. Piping in pits and aboveground may be joined with flanges instead of joints indicated.

B. Use pipe, tube, fittings, and joining methods according to the following applications.

C. Pressure Piping Underground: Use the following:

1. 3-inches (ON 80) and Smaller: ASTM 0 1785, Schedule 40, polyvinyl chloride (PVC) plastic pipe; ASTM 0 2466, Schedule 40, PVC plastic, socket-type pipe fittings; and solvent-cemented joints.

D. Circuit Piping: Use the following:

1. All Sizes: ASTM 0 1785, Schedule 40, polyvinyl chloride (PVC) plastic pipe; ASTM 02466, Schedule 40, PVC plastic, socket-type fittings; and solvent-cemented joints.

E. Branches and Offsets at Sprinkler and Devices: ASTM 0 1785, Schedule 80, polyvinyl chloride (PVC) plastic pipe with threaded ends; ASTM 0 2464, Schedule 80, PVC plastic, threaded fittings; and threaded joints.

F. Drain Piping: ASTM 0 1485, Schedule 40, polyvinyl chloride (PVC) plastic pipe; ASTSM 02466, Schedule 40 PVC plastic, socket-type fittings; and solvent-cemented joints.

G. Sleeves: ASTM 0 1785, Schedule 40, polyvinyl chloride (PVC) plastic pipe; ASTM 0 2466, Schedule 40, PVC plastic, socket-type fittings; and solvent-cemented joints.

3.5 JOINT CONSTRUCTION

A. Flanged Joints: Align flanges and install gaskets. Assemble joints by sequencing bolt tightening. Use lubricant on bolt threads.

B. Threaded Joints: Thread pipes with tapered pipe threads according to ASME B1.20.1, apply tape or joint compound, and apply wrench to valve ends into which pipes are being threaded.

C. Polyvinyl Chloride (PVC) Piping Gasketed Joints: Construct joints between underground AWWA-type, cast-iron valves and NPS PVC pipe; with elastomeric seals that fit pipe diameter and valve ends; and lubricant, according to ASTM 0 3139.

D. Polyvinyl Chloride (PVC) Piping Solvent-Cemented Joints: Construction joints according to ASTM 0 2672 and ASTM 0 2855.

1. Handling of Solvent Cements, Primers, and Cleaners: Comply with procedures in ASTM F 402 for safe handling when joining plastic pipe and fittings with solvent cements.

3.6 PIPING SYSTEMS - COMMON REQUIREMENTS

A. General Locations and Arrangements: Drawings indicated general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, and in other design considerations. Install piping as indicated, except where deviations to layout are approved on coordination drawings.

B. Install piping at a uniform slope of 6-inches per 10CY::feet (1":200) minimum, down to drain points.

C. Install components having pressure rating equal to or greater than system operating pressure.

D. Install piping free of sags and bends.

E. Locate groups of pipes parallel to each other, spaced to permit valve servicing.

F. Install fittings for changes in direction and branch connections.

G. Piping Connections: Except as otherwise indicated make piping connections as specified below.
   1. Install unions, in piping 2-inches (ON 50) and smaller, adjacent to each valve and at final connection to each piece of equipment having 2-inch (ON 50) or smaller threaded pipe connection.
   2. Install flanges, in piping 2%-inc;:hes (ON 65) and larger, adjacent to flanged valves and at final connection to each piece of equipment having flanged pipe connection.
   3. Install dielectric fittings to connect piping of dissimilar metals.

3.7 TRENCHES:

A. Trenches shall be dug as wide and deep as necessary to properly place the sprinkling system according to the requirements herein. Any rock uncovered in this excavation shall not be left in the backfill. All excess rock shall be removed from the site by this Contractor and legally disposed of off the property. All trenches shall be backfilled and compacted to insure no settling of the surface, after the lawn is planted.

B. If backfill soil is rocky or lumpy, protect the pipe and the pipe conduit with 8" of sand or loose, rock free, soil under, over and on sides of pipe. Avoid putting large rocks against pipe during backfilling operation.

C. All trenches must be compacted to 90% in 6" lifts and watered in. Lines from control valves shall be installed after topsoil is in place and properly graded.

D. This Contractor, in placing the sprinkling lines, etc., may uncover material not suitable for finished grading. This material shall be removed from the site by this Contractor. After the installation of the lines, the finished grading shall be smoothed over and restored to its original condition, using additional topsoil at this Contractor's expense, if this is necessary. The upper 6" of topsoil removed in the excavation of trenches for pipeline shall be conserved and kept separate from subsoil and reinstalled without mixing with other soil.

E. Trenches where more than one pipe is to be installed, a distance of 6" is to be maintained between each pipe.

F. All trenches are to be 12" away from all curbs, buildings and sidewalks. No exceptions.

3.8 PIPING INSTALLATION

A. Install underground polyvinyl chloride (PVC) plastic pipe according to ASTM 0 2774.

B. Lay piping on solid sub-base, uniformly sloped without humps or depressions.
   1. Slope circuit piping down toward drain valve minimum of %-inch in 1O-feet (1 :240).
   2. Install polyvinyl chloride (PVC) plastic pipe Ifr dry weather when temperature is above 40 deg. F (4 deg. C). Allow joints to cure at least 24-hours at temperature above 40 deg. F (4 deg. C) before testing, unless otherwise recommended by manufacturer.

C. Drain Pockets: Excavate to sizes indicated. Backfill with cleaned gravel!.and crushed stone, graded from 3-inches (75 mm) to o/..-inch (19mm) minimum, drain material to 12-inches (300 mm) below grade. Cover drain material with sheet of ASTM D 226, Type II, asphalt-saturated felt and backfill remainder with excavated material. Drain pocket to be minimum 6 cubic feet.

D. Minimum Cover: Provide following minimum cover over top of buried piping:
   1. Pressure Piping: Greater depth of minimum of 24-inches (600 mm) below finished grade.
   2. Circuit Piping: 15-inches (380 mm).
   3. Drain Piping: 15-inches (380 mm).
   4. Sleeves: 24-inches (600 mm).

E. Install piping under sidewalks and paving in sleeves.

3.9 VALVE APPLICATIONS

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, following requirements apply:
   1. Buried Valves 3-inches (DN 80) and larger: AWWA, gate valves, non-rising stem, with stem nut and valve box.
   2. Buried Valves 2-inches (DN 50) and Smaller: Bronze-body, curb stop, with tee head, service box and shutoff rod.

3.10 VALVE INSTALLATION

A. Valves: Install underground valves in valve boxes or pits.
   1. Install valves and polyvinyl chloride (PVC) pipe with restrained, gasketed joints.

B. Curb Stops: Install underground curb stops in service boxes.

C. Control and Ball Valves: Install in valve control valve boxes, arranged for easy adjustment and removal. Install unions with one (1) on upstream side at each valve manifold.

3.11 PRESSURE REGULATOR INSTALLATION

A. Install pressure regulators with shutoff valve and strainer on inlet and pressure gage on outlet. Install shutoff valve on outlet and valved bypass where indicated.

3.12 SPRINKLER INSTALLATION

A. Sprinklers: Flush circuit piping with full head of water and install sprinklers after hydrostatic test is complete.
   1. Install lawn sprinklers at manufacturer's recommended heights.
   2. Install shrubbery sprinklers at heights indicated.
   3. Locate part-circle sprinklers to maintain a nilnimum-distance of 12-inches (400 mm) from walls and 2-inches (50 mm) from other boundaries, unless otherwise indicated.

3.13 AUTOMATIC CONTROL SYSTEM INSTALLATION

A. Install controllers according to manufacturer's written instructions and as indicated.

B. Install controllers on Unistrut or similar mounting system. Attach to wall where shown. Provide and install wire gutter for wiring connections at controller.

C. Run one extra wire from the adjacent controller to each group of valves ,for future use and stub into the valve box.

D. Install control wiring in same trench with piping.

3.14 CONNECTIONS

A. Connect piping to sprinklers, devices, valves, control valves, specialties, and accessories.

B. Connect water supplies to irrigation systems. Include backflow preventers on potable water supplies. Include automatic filters on secondary water supplies.

C. Electrical Connections: Connect to power source, controllers, and automatic control valves.

D. Minimum requirements for electrical installations are specified in Division 16.

E. Ground systems according to Division 16 Section "Grounding."

3.15 FIELD QUALITY CONTROL

A. Testing: Perform hydrostatic test of piping and valves before backfilling trenches. Piping may be tested in sections to expedite work.

1. Cap and subject the piping system to a static water pressure of 50 psig (345 kPa) above the operating pressure without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4-hours. Leaks and loss in test pressure constitute defects that must be repaired.
2. Repair leaks and defects with new materials and retest system or portion thereof until satisfactory results are obtained .
3. Notify Architect 24 hour in advance of pressure testing so test may be observed.

3.16 CLEANING AND ADJUSTING

A. Flush dirt and debris from piping before installing sprinklers and other devices.

B. Adjust automatic control valves to provide flow rate of rated operating pressure required for each sprinkler circuit.

C. Carefully adjust lawn sprinklers so they will be flush with, or not more than Yz-inch (13 mm) above, finish grade after completion of landscape work.

D. Adjust settings of controllers and automatic control-valves.-

3.17 COMMISSIONING

A. Starting Procedures: Follow manufacturer's written procedures. If no procedures are prescribed by manufacturers, proceed as follows:
   1. Verify that specialty vales and their accessories have been installed correctly and operate correctly.
   2. Verify that specified test of piping are complete.
   3. Check that sprinklers and devices are correct type.
   4. Check that damaged sprinklers and devices have been replaced with new materials.
   5. Check that potable water supplies have correct type backflow preventers.
   6. Energize circuits to electrical equipment and devices.
   7. Adjust operating controls.

   B. Operational Testing: Perform operational testing after hydrostatic testing is completed, backfill is in place, and sprinklers are adjusted to final position.

C. Provide irrigation system layout and diagram in CADD format with water zones clearly identified. Layout to be color coded with a maximum of 5 colors for easy legibility. Record water budget for each irrigation control zone and current settings. Provide laminated copy and mount near controller. Verify location with Architect.

3.18 DEMONSTRATION

A. Demonstrate to Architect that system meets coverage requirements and that automatic controls function properly.

B. Demonstrate to Owner's maintenance personnel operation of equipment, sprinklers, specialties, and accessories. Review operating and maintenance information.

C. Provide 7-days' written notice in advance of demonstration.

END OF SECTION

Guide Specifications – Single-Wall FRP Tanks for Water Use

The contractor shall provide a single-wall fiberglass reinforced plastic (FRP) Underwriters Laboratories-labeled underground storage tank as shown on the drawings. The tank size, fittings and accessories shall be as shown on the drawings. The fiberglass tank shall be manufactured by Xerxes Corporation or approved equal. Tank shall be tested and installed according to the Xerxes Installation Manual and Operating Guidelines for Single-Wall and Double-Wall Fiberglass Underground Storage Tanks in effect at time of installation.

Part I: General

1.01 Quality Assurance

A. Acceptable Manufacturer: Xerxes Corporation

B. Governing Standards, as applicable:

Tank manufacturer shall be in the business of manufacturing tanks to Underwriters Laboratories (UL) Standard 1316. Tank manufacturer shall be in the business of manufacturing tanks with materials conforming to the requirements of NSF Standard 61.

Part II: Products

2.01 Single-Wall Fiberglass Reinforced Plastic (FRP) Underground Storage Tanks

A. Loading Conditions – Tank shall meet the following design criteria:

1. Internal Load – Tank shall withstand a 5-psig air-pressure test with 5:1 safety factor. When tank is designed for on-site testing, contractor shall individually test tank for leakage prior to installation. Maximum test pressure is 5 psig (3 psig for a 12'-diameter tank).
2. Vacuum Test – To verify structural integrity, every 10'-diameter tank and smaller shall be designed to withstand a vacuum test to 11.5" of mercury.
3. Surface Loads – Tank shall withstand surface H-20 axle loads when properly installed according to tank manufacturer's current Installation Manual and Operating Guidelines.
4. External Hydrostatic Pressure – Tank shall be capable of being buried in ground with 7' of overburden over the top of the tank, the hole fully flooded and a safety factor of 5:1 against general buckling.
5. Tank shall support accessory equipment – such as internal pump platforms, drop/fill tubes, submersible pumps and ladders – when installed according to tank manufacturer's current Installation Manual and Operating Guidelines.

B. Product Storage

1. Tank shall be capable of storing water products with specific gravity up to 1.1.
2. Tank shall be vented to atmospheric pressure.
3. Tank shall be capable of storing products identified in the manufacturer's current standard limited warranty.

C. Materials

Tank shall be manufactured with 100% resin and glass-fiber reinforcement. No sand fillers. The laminate materials used in the internal coating system of a potable water tank shall conform to the requirements of NSF Standard 61.

D. Tank Dimensions (Refer to Xerxes literature on gallonage.)

1. Tank shall have nominal capacity of 10,000 or 20,000 gallons.
2. Tank shall have nominal outside diameter of 8' / 10' feet.

2.02 Accessories

A. Optional Anchor Straps (NOT A PART OF CONTRACT)
   1. Straps shall be FRP anchor straps as supplied by tank manufacturer.
   2. Number and location of straps shall be specified in current literature by tank manufacturer.

B. Manways
   All manways shall be flanged and 30"-nominal diameter, complete with gasket, bolting hardware and cover. Location is shown on tank drawings. Optional manway extensions shall be FRP. All tanks for potable water use require at least one manway.

C. Optional Drop/Fill Tubes
   Drop/fill tubes shall be FRP and shall terminate a minimum of 4" from the bottom of the tank. Drop/fill tubes for potable water tanks shall be manufactured with materials conforming to the requirements of NSF Standard 61 or shall be NSF-listed PVC.

D. Optional Ladders
   Ladders shall be the standard ladder as supplied by tank manufacturer. Ladders for potable water tanks shall be manufactured with materials conforming to the requirements of NSF Standard 61.

E. Optional Fittings
   All threaded fittings shall be constructed of carbon steel or FRP. All standard threaded fittings shall be half-couplings and shall be 2"-, 4"- or 6"-diameter. Reducers are to be used for smaller sizes where shown and provided by contractor. All FRP and PVC nozzles shall be flat-faced and flanged, and shall conform to ANSI B16.5 150# bolting pattern.

F. Optional Internal Pump Platforms
   Pump platforms shall be FRP. Pump platforms for potable water tanks shall be manufactured with materials conforming to the requirements of NSF Standard 61.
   Contact tank manufacturer with pump details, such as dimensions and weight.

Part III: Testing and Installation

3.01 Testing

A. Tank shall be tested according to the Xerxes Installation Manual and Operating Guidelines in effect at time of installation.

3.02 Installation

A. Tank shall be installed according to the Xerxes Installation Manual and Operating Guidelines in effect at time of installation.
B. Contractor shall be trained by the tank manufacturer, the state or other approved agency.

Part IV: Warranty

4.01 Warranty

A. Warranty shall be manufacturer's limited warranty for underground water and potable water tanks in effect at time of purchase.

SECTION 08310 - ACCESS HATCH
TYPE JD-AL HORIZONTAL ACCESS DOOR SPECIFICATION

I. PART ONE - GENERAL

1.01 SUMMARY
- A. Work included: Furnishing and installing factory fabricated vault access doors
- B. Related Work:

1.02 REFERENCES
- A. American Society for Testing and Materials (ASTM), 100 Bar Harbor Drive, West Conshocken, PA 19428-2959; (610) 832-9585, fax (610) 832-9555
  1. ASTM A 36-93a: Standard Specification for Structural Steel

1.03 SUBMITTALS
- A. Product Data: Provide manufacturer's product data for all materials in this specification.
- B. Shop Drawings: Show profiles, accessories, location, and dimensions.
- C. Samples: Manufacturer to provide upon request; sized to represent material adequately.
- D. Contract Closeout: Vault access door manufacturer shall provide the manufacturer's Warranty prior to the contract closeout

1.04 PRODUCT HANDLING
- A. All materials shall be delivered in manufacturer's original packaging.
- B. Store materials in a dry, protected, well-vented area. The contractor shall thoroughly inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.
- C. Remove protective wrapping immediately after installation [if applicable].

1.05 SUBSTITUTIONS
- A. Proposals for substitution products shall be accepted only from bidding contractors and not less than (10) working days before bid due date. Contractor guarantees that proposed substitution shall meet the performance and quality standards of this specification.

1.06 JOB CONDITIONS
- A. Verify that other trades with related work are complete before installing vault access door(s).
- B. Mounting surfaces shall be straight and secure; substrates shall be of proper width.
- C. Refer to the construction documents, shop drawings, and manufacturer's installation instructions.
- D. Observe all appropriate OSHA safety guidelines for this work.

1.07 WARRANTY/GUARANTEE
- A. Manufacturer's standard warranty: Materials shall be free of defects in material and workmanship for a period of (25) twenty five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge. Electrical motors, special finishes, and other special equipment (if applicable) shall be warranted separately by the manufacturers of those products.

II. PART TWO - PRODUCTS

2.01 MANUFACTURER

A. The BILCO Company, P.O. Box 1203, New Haven, CT 06505; 1-203-934-6363, Fax: 1-203-933-8478, Web: www.bilco.com

2.02 ACCESS DOOR

A. Furnish and install where indicated on plans vault access door Type JD-AL, size width (48" x length 72". Length denotes hinge side. The vault access door shall be double leaf. The vault access door shall be pre-assembled from the manufacturer.

B. Performance characteristics:
   1. Covers: Shall be reinforced to support a minimum live load of 300 psf (1464 kg/m2) with a maximum deflection of 1/150th of the span.
   2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
   3. Operation of the cover shall not be affected by temperature.
   4. Entire door, including all hardware components, shall be highly corrosion resistant. Please consult the manufacturer when doors are to be installed in unusually harsh environments or extremely corrosive conditions.

C. Covers: Shall be 1/4" (6.3 mm) aluminum diamond pattern.

D. Frame: Channel frame shall be 1/4" (6.3mm) extruded aluminum with bend down anchor tabs around the perimeter. A continuous EPDM gasket shall be mechanically attached to the aluminum frame to create a barrier around the entire perimeter of the cover and significantly reduce the amount of dirt and debris that may enter the channel frame.

E. Hinges: Shall be specifically designed for horizontal installation and shall be through bolted to the cover with tamperproof Type 316 stainless steel lock bolts and shall be through bolted to the frame with Type 316 stainless steel bolts and locknuts

F. Drain Coupling: Provide a 1-1/2" (38mm) drain coupling located in the right front corner of the channel frame [note: can be placed at a different location if specified].

G. Lifting mechanisms: Manufacturer shall provide the required number and size of compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and to act as a check in retarding downward motion of the cover when closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe fastened to a formed 1/4" gusset support plate.

H. A removable exterior turn/lift handle with a spring loaded ball detent shall be provided to open the cover and the latch release shall be protected by a flush, gasketed, removable screw plug.

I. Hardware:
   1. Hinges: Heavy forged aluminum hinges, each having a minimum 1/4" (6.3 mm) diameter Type 316 stainless steel pin, shall be provided and shall pivot so the cover does not protrude into the channel frame.
   2. Covers shall be equipped with an hold open arm which automatically locks the cover in the open position.
   3. Covers shall be fitted with the required number and size ofcompression spring operators. Springs shall have an electrocoated acrylic finish. Spring tubes shall be constructed of a reinforced nylon 6/6-based engineered composite material.
   4. A Type 316 stainless steel snap lock with fixed handle shall be mounted on the underside of the cover.
   5. Hardware: Shall be anti-corrosion throughout.

J. Finishes: Factory finish shall be mill finish aluminum with bituminous coating applied to the exterior of the frame.

III. PART THREE - EXECUTION

3.01 INSPECTION

A. Verify that the vault access door installation will not disrupt other trades. Verify that the substrate is dry, clean, and free of foreign matter. Report and correct defects prior to any installation.

3.02 INSTALLATION

A. Submit product design drawings for review and approval to the architect or specifier before fabrication.

B. The installer shall check as-built conditions and verify the manufacturer's vault access door details for accuracy to fit the application prior to fabrication. The installer shall comply with the vault access door manufacturer's installation instructions.

C. The installer shall furnish mechanical fasteners consistent with the vault access door manufacturer's instructions.

END OF SECTION 08310

PUMP SPECIFICATION
SECTION 15130

PART 1 GENERAL

1.01 SUMMARY
A. Section Includes: Centrifugal Pump assemblies and submersible pump assemblies.

1.02 REFERENCES
A.
B.
C. American Society of Testing and Materials (ASTM).
   1. A 36 / DIN ST-37- Specification for Structural Steel.
   2. A 325 - Specification for High-Strength Bolts for Structural Steel Joints.
D. American Welding Society (AWS).
   1. Dl .1 - Structural Welding Code - Steel.
E. National Electrical Manufacturers Association (NEMA)

1.03 DEFINITIONS
A Total Dynamic Head (TDG): The vertical distance measured from the pump inlet to the pump discharge plus the head loss that is part of the head energy which is lost because of friction as water flows, measured in feet.
B. Capacity: The discharge is gallons per minute (gpm).
C. Net Positive Suction Head (NPSH): the difference between the total suction head and the vapor pressure of the liquid, in feet of liquid, at the suction flange

1.04 SYSTEM DESCRIPTION
A. **Standard Centrifugal Pump**: Each centrifugal pump shall be furnished complete with mounting base, direct coupled motor and pump of the capacity described below.
   1. Camp Floyd Cemetery
      a. Minimum rated capacity per pump - 55 gpm @ 125 TDH
      b. 110/220 volt, single phase, 3 Hp
      c. 2" suction
      d. 1 ½" discharge

   2. Camp Floyd / Stagecoach Inn
      a. Minimum rated capacity per pump - 38 gpm @ 120 TDH
      b. 110/220 volt, single phase, 2.5 Hp
      c. 2" suction
      d. 1 ½" discharge

B. **Submersible pump**: Each submersible pump shall be GRUNDFOS SQ SERIES as specified
   1. Camp Floyd Cemetery
      a. Minimum rated capacity per pump - 20 gpm @ 48 TDH
      b. 110/220 volt, single phase, 0.5 Hp

c. 1 1/4" discharge
d. 3" diameter

2. Camp Floyd / Stagecoach Inn
   a. Minimum rated capacity per pump - 20 gpm @ 22' TDH
   b. 110/220 volt, single phase, 0.5 Hp
   c. 1 ½" discharge

1.05 SUBMITTALS

A. Shop Drawings and Product Data: A complete set of drawings, specifications, catalog cut-sheets, and detailed descriptive material. This information shall identify all technical and performance requirements stipulated on the drawings and in the specification.

1.06 QUALITY ASSURANCE

A. Require pump supplier to furnish and coordinate pump, motor, and pump components as specified and scheduled below and to provide written installation and check out requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. General: As specified in Section

B. Packing and Shipping:
   1. All materials shall be suitably packaged and braced to protect against damage during transit, handling, and unloading.
   2. Manufacturer shall package equipment, be responsible for, and makegood, any and all damage until the equipment is delivered to the job site.
   3. Accessories shall be packaged separately in containers clearly marked "ACCESSORIES ONLY".
   4. A packing list, listing the contents of each container, shall be placed in a moisture proof envelope and securely fastened to the outside of the container.
   5. Provide written storage procedures for all equipment.

C. Acceptance at Site:

D. Storage and Protection: Protect the system components at the site and during installation prior to project completion. As a minimum, provide cover, ventilation, and proper stacking to prevent warping of any equipment stored on-site.

1.08 WARRANTY

A. The pump are warranted to be free of mechanical defects for twelve (12) months after installation or fifteen (15) months after shipping date, whichever comes first.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. GORMAN-RUPP COMPANY

B. STA-RITE INDUSTRIES
C. GRUNDFOS
D. OR EQUAL

2.02 MATERIALS:

2.03 CENTRIFUGAL PUMP

A.	Casing:	Gray iron no. 40, maximum operating pressure 120 lbs.
B.	Impeller:	Closed type, six vanes, gray iron no. 40 (handles 9/32 dia. Spherical solids)
C.	Impeller Shaft:	Steel no. 1045
D.	Bearing housing:	Gray iron no. 40
E.	Seal plate:	Gray iron no. 40
F.	Mounting foot:	Stainless Steel no. 420
G.	Shaft Sleeve:	Stainless Steel no. 420
H.	Radial Bearing	Single Ball type
I.	Thrust Bearing	Single Ball type
J.	Gaskets	Nitrile Rubber
K.	O-rings	Viton
L.	Hardware	Standard Plated Steel
M.	Seal	Mechanical self-lubricated rotating face is carbon, statinary face is ceramic.

2.04 SUBMERSIBLE PUMP

A. GRUNDFOS 3" 22-SQ-40

2.05 RESIDENTIAL BOOSTER PUMP SYSTEM

A. TRAMCO PUMP COMPANY - 20 gpm @ 35 psi
   1. Pre-assembled package MB-1020
   2. ½ Horsepower. 115 volt, single phase
   3. 44 gallon pressure tank
   4. Vertical design
   5. 1" connections
   6. Adjustable pressure switch
   7. Check valve
   8. Pressure relief valve

PART 3 EXECUTION

3.01 EXAMINATION

14

A. Verification of Conditions: Inspect all components for shipping damage and conformance to specifications.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions and as specified in this Section.

3.03 TESTING

A. After complete installation of the pump(s), the unit(s) shall be field tested to confirm the following:

1. Equipment has not been damaged in transport and installation.
2. Equipment is properly installed.
3. All components are properly connected and established tolerances are observed.
4. Equipment is free of objectionable vibrations and overheating parts.
5. Equipment is not overloading any part.
6. Equipment has no electrical or mechanical defects.

3.05 OPERATOR TRAINING

A. Training: As specified with start up.

B. Provide operator training for OWNER'S personnel after the system is operational. Training shall take place while manufacturer's representative is at the job site for equipment inspection.

END OF SECTION

SECTION 26 09 13.20
ELECTRIC CONTROLS - RELAYS AND PUSHBUTTONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pushbutton and selector switches
B. Control stations
C. Relays
D. Time delay relays
E. Control power transformers
F. Control panels

1.02 REFERENCES

A. NEMA ICS 1 - General Standards for Industrial Control Systems
B. NEMA ICS 2 - Standards for Industrial Control Devices, Controllers and Assemblies
C. NEMA ICS 6 - Enclosures for Industrial Controls and Systems
D. NEMA ST 1 - Standard for Specialty Transformers (Except General Purpose Type)

1.03 SUBMITTALS

A. Submit shop drawings to NEMA ICS 1 indicating control panel layouts, wiring connections and diagrams, dimensions, support points.
B. Submit product data for each component specified.

1.04 PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of control equipment. Revise diagrams included in Drawings to reflect actual control device connections.

1.05 OPERATION AND MAINTENANCE DATA

A. Include instructions for adjusting and resetting time delay relays, timers, and counters.
B. Include recommended preventive maintenance procedures and materials.

1.06 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this Section with documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS - CONTROL SWITCHES AND STATIONS

A. CONTACTS: NEMA ICS2

1. Form A contact blocks shall be Square D Class 9001 Type KA. All contact blocks shall have terminals that are fingersafe, meeting VDE0106 Part 100, single screw mounting, and captive, ready-to-wire, plus/minus terminal screws. The contact blocks shall have double break silver contacts with wiping action. All contact blocks will accept #12-#24 solid or stranded wires.

B. LIGHT MODULES: NEMA ICS2

1. All light modules shall be Square D Class 9001 Type KM. All light modules shall have terminals that are fingersafe, meeting VDE0106 Part 100, single screw mounting, and captive, ready-to-wire, plus/minus terminal screws. All light modules will accept #12-#24 solid or stranded wires.

C. CONTACT RATINGS: NEMA ICS2

1. All Control Switches shall have ac contact ratings of NEMA A600 (Inductive - 35% power factor, Resistive - 75% power factor). All Control Switches shall have dc contact ratings of NEMA A600 (Inductive and Resistive).

D. SELECTOR SWITCH OPERATORS: NEMA ICS 2

1. Two-, Three-, or Four-position rotary selector switches shall be Square D Class 9001 Type K, SK, or KX using Class 9001 Type KA contact blocks.

E. PUSH BUTTON OPERATORS: NEMA ICS 2

1. Unguarded, Flush, Recessed, Shrouded, Shielded, Covered, Lockable type push button operators shall be Class 9001 Type K, SK, or KX using Square D Class 9001 Type KA contact blocks.

F. CONTROL STATIONS

1. All standard duty control stations shall be manufactured in accordance with the latest published NEMA standards. All standard duty control stations shall be furnished in NEMA 1 general purpose enclosures unless otherwise indicated on the plans. Stations shall be available in general purpose enclosures in combinations of from 1 to 3 units. General purpose enclosures shall have non-metallic wrap-around, slip-on cover assemblies which shall be held in place by two screws.

2. All push button and selector switch control units used in standard duty control stations shall be of plug-in construction and shall have double break silver contacts. Contacts shall be either single-pole, single-throw or double-pole, single-throw as specified. Pilot lights used in standard duty control stations shall be able to be used on 120 volt ac or dc, using a 120 volt slide base lamp, as specified. Colored pilot light lenses shall be interchangeable.

G. START-STOP PUSH BUTTON AND 120 VOLT AC OR DC PILOT LIGHT STATIONS

1. Shall be Square D Class 9001 Type BG-308, standard duty, momentary contact type with general purpose enclosure or Type BF- 308 flush mounting for recessed installation, as specified.

H. HAND-OFF-AUTO SELECTOR SWITCH STATIONS

1. Shall be Square D Class 9001 Type BG-112, standard duty, maintained contact type with general purpose enclosure or Type BG-112 flush mounting for recessed installation, as specified.

I. HEAVY DUTY ENCLOSURES

1. Shall be NEMA Types 1, 3, 13 in sheet steel (1-30 holes), NEMA Types 1, 3, 4, 13 in cast aluminum (1-16 holes), NEMA Types 1, 3, 4, 4X, 13 in stainless steel or polymeric style (1-30 holes).

J. HEAVY DUTY CONTROL STATIONS

1. Shall use Class 9001 Type K, SK, or KX push buttons, selector switches and pilot lights using Class 9001 Type KA contact blocks. All operators used shall be suitable for cover mounting in a 1-7/32 in diameter notch type cover hole and shall be held in place by the function nameplate or locking thrust washer in the event no nameplate is used. Push buttons and selector-push buttons shall have removable inserts in seven different colors for function color coding. Push button inserts and selector switch knobs shall be removable from the front of the control station without disturbing the wiring or mounting of the control units. Selector switches shall have removable knobs in nine different colors for function color coding.

K. Limit Switches: [ ], [Model], manufactured by Square D Company and/or Telemecanique.

L. Pressure Switches: [ ], [Model], manufactured by Square D Company

M. Temperature Switches: [ ], [Model], manufactured by [Square D Company] [approved equal].

N. Flow Switches: [ ], [Model], manufactured by [Square D Company] [approved equal].

O. Photocell Switches: [ ], [Model], manufactured by Square D Co. and/or Telemecanique.

P. Level Switches: [ ], [Model], manufactured by [Square D Company] [approved equal].

Q. Proximity Switches: [ ], [Model], manufactured by Square D Co. and/or Telemecanique.

2.02 MANUFACTURERS - CONTROL RELAYS

A. All 600 VAC and 250 VDC magnetic relays shall have convertible contacts and shall be Square D Class 8501 Type X. Contacts shall be double break, silver alloy. Contacts shall be convertible from normally open to normally closed or vice versa, without removing any wiring. Contacts shall be color coded to indicate status.

B. Contact ratings shall be NEMA A600 and P300 and shall conform to NEMA ICS 2.

C. Coil voltages shall be available from 12 to 600 VAC and 6 to 250 VDC. Relay shall be expandable

from 2 poles to 12 poles. Relay shall have accessories to provide pneumatic timing and mechanical latching provisions.

D. Coils shall be of molded construction and continuous duty rated. Terminals shall be provided with pressure wire connectors. Relay shall have common mechanical tie bar. Relay shall have overlapping contact cartridges available and 20 ampere master contact cartridges available. Relay shall have logic reed adder deck available. Relay shall have transient suppressor accessory available. Relay shall have a utility relay version available suitable for use in Power Plant Applications.

E. Relay shall be specified on lists of major automotive plants.

F. Relay shall have the capability of mounting directly to a panel and also to mounting track.

2.03 MANUFACTURERS - TIME DELAY RELAYS

A. Contacts: NEMA ICS 2; Form [Z.] [A.] [B.] [C.]

B. Contact Ratings: NEMA ICS 2; Class [A150] [ ].

C. Coil Voltage: [120] [ ] V, [60 Hz., ac] [dc].

D. Time-Delay Relays: NEMA ICS 2; Class [A600] [ ] [pneumatic] [solid-state] time-delay relay with [ ] second time delay after [energization.] [de-energization.] [Model], manufactured by [Square D Company] [approved equal].

E. Interval Timing Relay: NEMA ICS 2; Class [A300] [ ], [repeat cycle timer] [manual reset timer].

F. Clock Timer: NEMA ICS 2; Class [A300,] [ ], [24 hour] [7 day] timer with [astronomical dial,] [12-hour spring-wound carry-over], [and] [ ], [Model], manufactured by [Square D Company] [approved equal].

2.04 CONTROL POWER TRANSFORMERS

A. Transformer: NEMA ST 1; machine tool transformer with isolated secondary winding.

B. Power Rating: [ ] VA.

C. Voltage Rating: [480] [120] [ ] V primary; [120] [24] [ ] V secondary.

2.05 ENCLOSURES

A. Control Station Enclosure: NEMA ICS 6; Type [1] [ ].

B. Relay Enclosure: NEMA ICS 6; Type [1] [ ].

PART 3 EXECUTION

3.01 INSTALLATION

A. Install devices and equipment in accordance with manufacturer's instructions.

B. Install individual relays and time delay relays in enclosures.

C. Make electrical wiring interconnections as shown on Drawings.

END OF SECTION

SECTION 26 28 16.15
CIRCUIT BREAKER ENCLOSURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Circuit breaker enclosures shall be furnished and installed at locations as shown on the drawings. Enclosures shall be of the type approved, indicated, and specified herein.

1.02 REFERENCES

Circuit breaker enclosures shall be manufactured in accordance with the following standards:

A. UL®489 - Molded Case Circuit Breakers and Circuit Breaker Enclosures

B. UL® 50 - Cabinets and Boxes

C. NEMA® 250 - Enclosures for Electrical Equipment

1.03 SERVICE ENTRANCE

A. Circuit breaker enclosures identified for use as service equipment are to be labeled for this application.

1.04 SUBMITTALS

A. Provide outline drawings with dimensions, voltage, amperage, and integrated equipment short circuit current ratings.

PART 2 PRODUCT

2.01 MANUFACTURERS

A. Circuit breaker enclosures shall be manufactured by Square D®/Schneider Electric or approved equal.

2.02 OPERATING MECHANISM

A. The circuit breaker operating handle shall be [externally operable with the operating mechanism being an integral part of the box, not the cover (circuit breakers through 1000 amperes in Type 4-4X-5 stainless steel, 12, 12K [directly operable through the front cover of the enclosure (Type 1)] [directly operable through the dead front trim of the enclosure (Type 3R)] [externally operable with the operating mechanism being an integral part of the cover (Type 7, 9)].

B. Provisions for padlocking the circuit breaker in the OFF position shall be provided.

C. Enclosures designated as Type 4-4X-5 stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and prevent turning the circuit breaker ON when the enclosure cover is open. The cover interlock mechanism shall have an externally operated override but the override shall not permanently disable the interlock mechanism. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

2.03 ENCLOSURE

A. Enclosure covers shall be [attached with pin-type hinges (Type 4-4X-5 stainless steel, 12, 12K)] [top or side hinged (Type 3R)] [attached by type 316 stainless steel bolts (Type 7, 9)].

B. The enclosure shall be finished with [gray baked enamel paint which is electrodeposited on cleaned, phosphatized steel (Type 1)] [gray baked enamel paint which is electrodeposited on cleaned, phosphatized galvannealed steel (Type 3R, 12, 12K)] [A brush finish on Type 304 stainless steel (Type 4-4X-5 stainless steel)] [copper free cast aluminum alloy (Type 7, 9)].

C. The external operating handle shall be provided with a dual colored, red/black indicating handle knob [Type 4-4X-5 stainless steel, 12 and 12K for circuit breaker enclosures rated through 1000 amperes].

D. Tangential knockouts shall be provided to facilitate ease of conduit entry (Type 1, 3R, 12K) through 225 amperes.

E. Type 12 and 4-4X-5 stainless steel enclosures shall contain no knockouts; supply watertight hubs as indicated on the plans.

F. Type 7 and 9 enclosures shall be provided with threaded conduit openings in both endwalls.

G. Enclosures for Type 3R application through 225 amperes shall have provisions for interchangeable bolt-on hubs in the top endwall. Hubs shall be Square D/Schneider Electric B-Type hubs sized as indicated on the plans.
H. Cover sealing means for enclosures rated through 1200 ampere shall be quick-release trunk latches (Type 4-4X-5 stainless steel, 12, and 12K).
I. Type 12, 4-4X-5 enclosur1es shall be dual rated as Type 3R to facilitate their use in outdoor applications.

2.04 ENCLOSURE RATINGS

A. The integrated equipment short circuit current rating shall be equal to the interrupting rating at the supply voltage marked on the circuit breaker installed, up to 200,000 rms symmetrical amperes short circuit current, or as shown on enclosure wiring diagram.

PART 3 EXECUTION

NOT USED

SECTION 26 24 19.05
LIGHTING AND APPLIANCE BRANCH CIRCUIT LOAD CENTERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Load centers to be furnished and installed at locations as shown on the drawings. Load centers shall be of the type approved, indicated, and specified herein.

1.02 SERVICE ENTRANCE LABEL

A. Load centers identified for use as service equipment are to be labeled for this application.

1.03 REFERENCES

A. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.

B. NEMA PB 1 - Panelboards

C. NEMA PB 1.1 - General Instruction For Safe Installation, Operation And Maintenance Of Panelboards Rated 600 Volts Or Less

D. Federal Specification W-C-375B/Gen - Circuit Breakers, Molded Case, Branch Circuit And Service.

E. Federal Specifications W-C-375B - Molded Case Circuit Breakers

F. Federal Specifications W-P115C - Type 1 Class 2 Load Center.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Load centers shall be manufactured by Square D Company [or approved equal].

2.02 ENCLOSURES

A. NEMA PB1: [Type 1] [Type 3R] as shown on the drawings.

B. Enclosure shall be fabricated of cold rolled steel for NEMA 1 and galvannealed steel or equivalent rust-resistant steel for NEMA 3R.

C. Indoor Type l enclosures shall have a [flush] [surface] front [and flush cylinder tumble-type lock, all keyed alike], with finish to be gray baked enamel.

D. Outdoor Type 3R enclosures shall have a hasp to secure the cover. Finish to be gray baked enamel.

E. A directory label shall be provided with circuits identified as indicated on the schedule

2.03 INTERIORS

A. NEMA PB1: [Type 1] [Type 3R] as shown on the drawings.

B. Bus bar connections to the branch circuit breakers shall be the distributed phase type and shall accept plug-on circuit breakers. 300-400 A load centers shall accept a 150 A maximum bolt-on breaker in addition to plug-on types.

C. Short Circuit Current Ratings

[22,000] [ ] ampere rms symmetrical short circuit ratings shall be provided per the schedule. This rating shall be established by manufacturer testing of a representative load center with branch circuit breakers installed.

2.04 SHORT CIRCUIT CURRENT RATINGS

A. [NEMA AB 1]

B. Circuit breakers shall be Square D type QO (plug-on) thermal magnetic trip, with an integral crossbar to ensure simultaneous opening of all poles in multi-pole circuit breakers.

C. Circuit breakers shall have an overcenter, tripfree, toggle-type operating mechanism with quick-make, quick-break action and positive handle indication.

D. Handles shall have ON, OFF, and "Tripped" positions. In addition, trip indication shall include a VISI-TRIP indicator appearing in the window of the circuit breaker case (through 125 amperes).

E. Circuit breakers shall be UL Listed in accordance with UL standard 489 with current ratings as noted on the plans. Interrupting ratings shall be selected to provide the required load center short circuit current rating.

F. Single-pole, 15 and 20 ampere circuit breakers intended to switch fluorescent lighting loads on a regular basis shall have the SWD marking.

G. Two- and three-pole circuit breakers 15-60 amperes intended for use with air conditioning, heating, and refrigeration equipment having motor group combinations and marked as such shall have the HACR marking.

H. Provide UL Class A ground fault interrupter circuit breakers where scheduled on drawings.

I. The following special application circuit breakers or circuit breaker accessories shall be provided where shown on the [schedule] [drawings]:

1. Circuit breakers with remote control switching capability
2. Circuit breakers for use on high intensity discharge lighting systems
3. Key operated circuit breakers
4. Switch neutral circuit breakers
5. Shunt trip, auxiliary switch, or alarm switch accessories

PART 3 EXECUTION

NOT USED